VISIBLE LANGUAGE • 46.1/2

special issue

ENVISIONING A FUTURE DESIGN EDUCATION

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Sharon Helmer POGGENPOHL

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46.1/2

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GUEST EDITOR _____ **Sharon Helmer POGGENPOHL**

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In American Indian legends of the West, the coyote is a trickster and culture hero.

COYOTE DESIGN

Sharon Helmer POGGENPOHL

Vermin, thieves
put a bounty on them
sneaky movers in the night
extinguish…
make them gone

Hear their howl?
Spine tingling, wild
    a hunt to celebrate
    calling to feast
    shadows moving

On what?
chickens…the newborn…
    carion…prairie dogs…
rabbits…the neighbor's puppy…
hunt them down–make them gone

They breed
    not alpha male and female
    all of them–they multiply
    filling the void of the departed
    replacing ancestors

See them
    sleek, prancing across the field
    in small groups alert
    beating the bounty–they live

WILE E. COYOTE(S)

→

Sharon Helmer POGGENPOHL is a former Professor of Design at the Hong Kong Polytechnic University and the Institute of Design, Illinois Institute of Technology in Chicago. In both positions her focus was on post-graduate design education and research. She has edited and published this journal since 1987 and has co-edited with Keiichi Sato *Design Integrations* (Intellect, 2009). Currently working on a book that deals with theory in design, she strongly believes that research and collaboration are the way forward in design. A recipient of teaching awards, she has written extensively and presented internationally.

Sharon Helmer POGGENPOHL

ENVISIONING A FUTURE DESIGN EDUCATION

an Introduction

ABSTRACT

The persistence of past traditions and the uncertainty of change can easily immobilize teachers who see the misfit of design education, but are reluctant to adapt and evolve new approaches to the teaching-learning paradigm. Using a recent statement by a former Harvard president, a few direct and unremarkable adaptations are suggested. This special issue is organized in three sections: Clarity in educational goals and student performance; Attention to dynamic change and interconnectedness; Differentiation and research in graduate programs. The invited authors are briefly introduced. They do not provide consensus, but offer different perspectives on change.

"Design process is the take-away in education; knowing how to continue learning, accessing and assessing useful information, and importantly, synthesizing information and creativity into something that delivers use and pleasure for people."

IN THIS TIME of volatile economic, social, technological and global change, reflection on teaching and learning is particularly appropriate from either a teacher or student perspective. Invited contributors to this special issue were prompted to examine the deficits in design education, to discuss transitions from past expectations to better performance, and even to speculate on a more distant future—perhaps a utopian design agenda for ten or twenty years hence.

Collaboration, paradigm change, metaphors, integrations and relationships between education and practice, even catharsis—these are some of the themes contained within the diverse papers collected in this issue. Change is seldom welcome or expected—unless the current context is boring, inappropriate—unbearable.

The typical and known is comforting in its predictability, while change is uncertain, sometimes threatening—and for some even unthinkable. Change demands attention, energy, planning and adaptation, behaviors that designers use in service to the future, whether near or far, as they create and stage change. But old traditions die slowly and are tenacious in their hold on people's understanding and performance.

Because design is so firmly and complexly enmeshed in the matrix of contemporary human life, it cannot avoid change. This is not the place to remember and recite the movements that reordered and changed design education in the 20th century (Bauhaus, Swiss design, Post-modernism, etc.), it is a moment

to consider 21st century developments and how design can better fit within a changing global culture and alter its goals in order to more fully contribute. The isolation of design's sub-disciplines (*Poggenpohl, 2009, 11*) make it difficult for teachers and practitioners to learn from each other, much less collaborate on significant projects that go beyond the expertise recognized in one of them. Sub-disciplines share many of the same foci and processes; design would gain from a more unified understanding of itself, regardless of its material or social specialism.

Few designers recognize the skills they bring to collaborative work. Their flexibility of mind to question boundaries, frame a situation for investigation, offer critical perspectives, create alternative prototypes and understandings and recognize and mediate conflicting values—this engagement makes a substantial contribution. Designers with these skills should move aside from traditional small projects and find ways to become engaged in the significant design problems of our time—sustainable development, design for the elderly, effective education and others too numerous to mention. Such work calls for collaborative, passionate and intelligent participation. Design is not little; it can be pivotal in bringing people and ideas together.

I liken the authors in this issue to the coyotes in the opening poem, who adapt to changing environmental circumstances, and hopefully survive to spread their intellectual seed. They may need to be tricksters to institute change, as administrative structures favor people deeply entrenched in their existing knowledge and success. If successful, the coyotes of learning and teaching will become quiet culture heroes known through their progeny, who will not be imitators but adaptors and inventors of the future in design education and its practice.

Many educators are aware of the need for change, but the variety and interconnectedness of its aspects are confounding. Where to start—what is most essential—these are fundamental questions, and if addressed, how do we know they are improvements? Lawrence H. Summers (*2012*), former president of Harvard University, states:

> *Suppose the educational system is drastically altered to reflect the structure of society and what we now understand about how people learn. How will what universities teach be different? (2012, 27).*

He offers six speculations regarding needed change, paraphrased below.

1 _____ TODAY INFORMATION IS ABUNDANT, our students need to understand how to process and use it.

2 _____ COLLABORATION is essential given the breadth of information and expertise significant projects require; we need to help people to work with each other.

3 _____ DIGITAL INFORMATION, e-books for example, can incorporate dynamic demonstrations and simulations. In a similar way, videos of the most engaging and adept teachers, if used, can open another teacher's time for coaching and mentoring.

4 _____ CONTENT MASTERY IS A PAST ARTIFACT OF LEARNING; active use of knowledge—its application—is what is now needed as a demonstration of mastery.

5 _____ IN THE CONTEXT OF GLOBALIZATION, students need international experience to broaden their cultural knowledge and experience of the world.

6 _____ THE ABILITY TO MANIPULATE AND ANALYZE DATA to support judgment and decision-making is an essential attribute of being well educated today.

This special issue of *Visible Language* uncovers the paradox of design education in the context of design as a change agent; a discipline that consciously proposes what does not yet exist. In contrast to its future orientation as practiced, design education is stuck in a now irrelevant past that is comfortable, pervasive, defended, valorized, established—and that fails to prepare students for their role as co-inventors of the future. With regard to the six changes listed above, in the context of project-based learning, typical in most design programs, it is possible to apply the first two mentioned (1, 2), as projects can require information access and application as a guide to form-making and prototyping performance; further, projects can be addressed by a cross-disciplinary team. Such changes are not remarkable—just sensible. This ties to process mastery in designing with active use of knowledge (4, 6). Design process is the take-away in education; knowing how to continue learning, accessing and assessing useful information, and importantly, synthesizing information and creativity into

something that delivers use and pleasure for people. Information alone, isolated research, or spontaneous creativity—these are inadequate design responses—what is called for is integration. Staying informed about change in its many dimensions and remaining curious and adaptable regarding new ideas are also keys to continued learning. Such changes as these to project-based learning provide transferrable skills, useful in many ways within and beyond design—in life. These changes support interactive exploration and exchange between teachers and students as they both experience a deepened understanding of design's possibilities.

Some of the above may challenge design faculty to teach in new ways that would develop their skills beyond their past education or professional experience. Support for faculty development is an administrative issue, often covered by grants and sabbaticals. Mechanisms are in place, competition for them may be substantial, but the need to reinvigorate design education—to look at the teaching-learning paradigm is too often overlooked in the process of teaching design. Where are the design teachers who constructively reflect on their teaching performance in relation to student learning? Where are those who set up experiments and report to a broader audience the results? Even sharing reflections through informal case studies are missing. Teachers need to reflect on the art of teaching and learning as there is no one formula, particularly in a creative, future-oriented discipline.

Returning to Summer's listing, e-books (3) and international experience (5) are also important. The digital revolution is changing access to material and competition for audience. Past notions of having a captive student audience in studio or resident at one university for the duration of a program may no longer be workable or desirable from many perspectives, cost, resource use, teacher knowledge limitation, redefinition of teaching activities and its formal supports (books, laboratories, e-sources, etc.), student expectations and students with fluid work-learning lives to name a few. Not all design classes can be taught remotely, but certainly some can. Having skyped with design research students at Hong Kong Polytechnic University for over a year, our time together online yielded effective learning results as reported in student comments. Perhaps more effective because of the preparation via email attachments and the focused time we spent together despite time zone difference. Webinars and online conferences like

GLIDE (*2012*), Global Interaction in Design Conference, for example, offer virtual presentations online to support moving past cultural and geographic boundaries, opening doorways to knowledge access and sharing within an interdisciplinary audience, and that further does not rely on travel. The technology also supports international team projects in which students partner on a project with students from another culture. Yes, there are kinks to be worked out, especially regarding different faculty expectation and direction, to say nothing of cultural difference, yet the experience is enriching. Again, we need research and reporting on teaching/learning projects; we need to share experience to advance our understanding and to develop a network of people moving in similar directions. Technology is not being used wisely in education; it has yet to be creatively explored and its potential benefits for all may be abundant. The authors invited to contribute to this issue present diverse ideas regarding needed changes for the future of design education. They do not spend time attacking the status quo, they credit the reader with knowledge of the contemporary situation; instead they offer constructive suggestions for change, evolutionary steps that can propel design education in small and large new directions, and that can provide a deeper understanding and commitment to teaching and learning than the shallows in which we seem to be caught.

Two generations of educators are present in this issue in a nearly balanced way. Like Summers' reflection on education at large, some contributors provide analyses and strategies, while others write about issues of complexity, integration and process. The issue has three sections as follows.

PART 1 _____ CLARITY IN EDUCATIONAL GOALS & STUDENT PERFORMANCE.

KAREL VAN DER WAARDE and MAURITS VROOMBOUT match the curricular needs for a communication design program to their interviews with Dutch designers regarding their design practice. They decode the changes in practice and look to improve curricula within a fairly traditional understanding of the discipline. The diagrams that accompany their article are not prescriptive, but suggestive of content and structures that might bring clarity to design curricula.

JORGE FRASCARA and GUILLERMINA NOËL take on the need to teach and practice user-centered design. They argue for an evidence-based approach to design that includes users and does not end until a results-oriented process to see if what is designed actually works is accomplished. The social function of design is very important to these authors and accountability is their goal.

DAVID SLESS challenges the all-encompassing notion of Design promoted in the 20th century and poses instead a more modest notion based on evidence. Using work from the Communication Research Institute in Australia, he demonstrates what this means to design as a sustainable and evolutionary process embedded in both natural and social systems.

AUDREY BENNETT concludes this section focusing on student performance evaluation with regard to typography. Defining good design as good social change, she also focuses on the social function of design and wants to steer student assessment away from being a solely aesthetic enterprise. Metrics for evaluation are provided at the article's conclusion.

PART 2 _____ ATTENTION TO DYNAMIC CHANGE & INTERCONNECTEDNESS.

THOMAS OCKERSE begins this section with an argument supporting deep learning through a holistic approach to students and teaching. He is concerned with collaboration and working together, as our knowledge and expertise is inevitably limited. Exploration that unites the deep character of the designer with practical knowledge and creativity, while respecting the contributions of partners, is what he is after. Cognizant of the problem of fragmentary knowledge and experience, he suggests we use both sides of our brain and seek interconnectedness.

CHRIS MYERS frames 'impromptus' putting design and human activity into several metaphorical contexts that speak poetically to the dynamic situation in which design both happens and currently exists. A storyteller, Myers engages the reader in

seeking out personal interpretations and connections that also reveal the unpredictability of events and our limitations while we strive for needed change.

PART 3 _____ DIFFERENTIATION & RESEARCH IN GRADUATE PROGRAMS.

MEREDITH DAVIS takes a strategic approach to the educational problem and points to opportunities in graduate programs to change design through significant degree preparation and meaningful curricular and degree differentiation. Research figures prominently in her concerns as she looks to the administrative and leadership support necessary to effect change.

STAN RUECKER, using 'cultural archive' as an analogy to what a teacher provides, examines perennial and particular challenges in graduate programs including generation gaps, assessment difficulties, future-orientation and interdisciplinary approaches among others. He concludes by offering another model for doctoral research.

KEN FRIEDMAN insists on moving aside from everyday design and its education to consider from both long and short historical perspectives how design fits contextually. Examining cultural, technological and economic systems along with their relationship with design performance helps to disambiguate the many perspectives on change. Finding the appropriate context for design education (and it is not one) underscores the importance of a broad education with research and collaborative skills that go beyond design basics.

DIETMAR WINKLER provides the last entry to this issue, a poem that serves as a counterpoint to the constructive, hopeful ideas shared within. It graphically reminds us of the entrenched stagnation teachers seek to escape. Having spent a lifetime in design and its education, the poem is cathartic, damning the persistent past and readying us for future preparation in the changing present.

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1

CLARITY IN EDUCATIONAL GOALS & STUDENT PERFORMANCE

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Karel van der WAARDE & Maurits VROOMBOUT

COMMUNICATION DESIGN EDUCATION: COULD NINE REFLECTIONS BE SUFFICIENT?

ABSTRACT

SITUATION _____ *Graphic design education is subject to substantial changes. Changes in professional practice and higher education aggravate insecurities about the contents and structure of courses, assessment criteria, relations between practice, research and theory and teaching methods.*

ASSUMPTION _____ *Graphic design education (visual communication design education) needs to change to accommodate these changes.*

APPROACH _____ *There are many possible starting points to tackle the 'wicked problem' of visual communication design education. The starting point for this article is professional practice. Through the observation of practice, and interviews with practicing graphic designers, a set of common activities and approaches was distilled. These commonalities—the things that all graphic designers seem to have in common—are visualized in two diagrams.*

RESULTS _____ *The two diagrams can be used as a basis for a critical review of current education in visual communication design, and they indicate a motivated and testable development for the coming years.*

"It is however remarkable that a profession that prides itself to be change-driven, visual and communicative is so poor in changing its education, visualizing its educational problems and communicating in a clear way about these."

INTRODUCTION: WHAT ARE THE PROBLEMS?

There are a number of issues and trends that appear increasingly prominent in discussions about graphic design education. Some of these appear in the literature (*Bennettt and Vulpinari, 2011*), while others only seem to be expressed in the corridors of educational establishments.

There are two external developments that force a rethink of graphic design education. The first external development is the change in professional practice itself. Increased use of digital technology, tighter economical control and globalization are three factors that directly influence day-to-day graphic design practice. The second external development is the fundamental changes in higher education. Changes in funding (a continuously changing mix of tuition, government support, consultancy fees and grants), organizational structures (integration of art schools into BA/MA structures, mergers with more traditional universities), increasing numbers of students, decreasing numbers of staff, and increasing requirements for qualifications of staff, provoke a state of flux.

The consequences of these external developments are exacerbated by insecurities within graphic design education in the following five areas.

1 **COURSE CONTENTS & STRUCTURE.** The substance of graphic design education, its structure and the sequence in which it is taught should always be part of educational discussions. However, because there is no generally accepted overview of professional practice, this

discussion is rarely based on reliable data. It is therefore hard to establish if the structure and sequence of a curriculum of a BA or MA course provide all the essential topics that are necessary to practice afterwards. It might very well be the case that important parts of professional practice are not covered, or that some parts are over emphasized, if they are compared with their relevance in practice.

2 ASSESSMENT CRITERIA. The criteria for assessing the activities of students are frequently unclear in character and meaning. This has an effect on enrollment procedures, project assessments and for degree examinations.

3 RESEARCH. Research and practice are rarely integrated. Evidence based arguments, application of validated design methods, detailed recording of processes and publications of results are rare and are not very often taught.

4 THEORY. The underpinning of commonly held beliefs in both graphic design practice and in graphic design education is poor. As a consequence, questionable opinions remain unchallenged and form part of education for a long time.

5 TEACHING METHODS. Due to a reduction in staff-student ratio, the relations between teachers and students are under pressure. Alternative teaching methods need to be considered, developed, tested and implemented. Unfortunately, very few experiments are currently undertaken and little progress is made at a very slow pace.

The external developments and the internal insecurities suggest that it is necessary to reconsider some fundamental assumptions about graphic design practice and graphic design education. This reconsideration is not new. The discussion that it is necessary to change graphic design education goes back a long time and fits within a wider discussion about the education of professionals. Donald Schön noticed about 25 years ago the need for a new approach to educate professionals (*Schön, 1987*).

It is however remarkable that a profession that prides itself to be change-driven, visual and communicative is so poor in changing its education, visualizing its educational problems and communicating in a clear way about these.

TWO DIAGRAMS

Approaching the abovementioned issues in relation to graphic design education has all the characteristics of a 'wicked problem' (*Rittel, 1972*). And although Rittel suggests that it is not possible to provide 'a definite description,' it is worthwhile to develop a preliminary version of a description of 'visual design practice' as a starting point for discussions.

A Description of Visual Communication Design?

The following description is based on preliminary results of recent research (August 2007 - May 2011) undertaken in the Netherlands. The outline is constructed from the results of an ongoing research project that aims to describe 'visual design practice.' Visual designers—who operate under a range of titles like 'graphic designer,' 'information designer,' 'interaction designer,' 'web designer'—provide the data. The research uses observations of practice and depth interviews to find out how practitioners really work (*Van der Waarde, 2009*). This description is being tested, discussed and will be updated according to subsequent findings.

The research so far indicates that visual designers seem to follow two main patterns: 'considering visual configurations' and 'professional reflections.' The consideration of visual configurations is specific for visual designers. The professional reflections are more general. Below follows a brief description of both patterns.

Considering Visual Configurations

In a project, visual designers undertake three activities:

1 _____ **THEY CONSIDER VISUAL ELEMENTS,**
2 _____ **THEY CONSIDER VISUAL STRATEGIES,**
3 _____ **AND THEY CONSIDER THE DIALOGUE BETWEEN A COMMISSIONER AND THE BEHOLDER.**

They switch continuously between these three activities to achieve a combination in which all considerations are satisfactorily dealt with in a single visual configuration. This 'combination' is called 'concept.' Considering all three activities at the same time is called 'concept-development.' These three activities can be further detailed as follows:

ACTIVITY 1 _____ **CONSIDERING VISUAL ELEMENTS.**

There are only four kinds of visual elements: text elements, image elements, schematic elements and 'inseparable combinations.' Visual designers choose, and sometimes make, these elements and combine them. Text elements are shaped through the conventions of typographical design. Image elements are all visual matters that can be interpreted as pictures: photographs, illustrations, symbols, etc. Visual elements that do not have a direct meaning, but provide structure and ornament such as lines, colors, frames and borders are 'schematic elements.' And the last group, 'inseparable combinations,' is visual elements that are combinations of the other three types but that must be used as a whole. Examples are logos with a brand name, diagrams and maps. Designers either use these as complete elements or redesign these as complete elements. In the digital realm, these four kinds of visual elements are considered in combination with sounds or movements.

ACTIVITY 2 _____ **CONSIDERING A VISUAL STRATEGY.**

Visual strategies combine three aims: identity, representation (contents, message (*bericht, boodschap*)), orientation (structure). In most projects, one of these aims is dominant. However, all three need to be considered. The first aim of visual design is the need to identify the commissioner or speaker. It must be made clear—through the use of recognizable visual identity elements—who originates a message. The second aim is to present the contents of the complete message into a visual format/structure. This format/structure represents the structure of information. And the third aim is to make it possible for a reader/user/beholder to navigate through the information. People must be able to orient themselves in order to start reading and to decide how to continue. Visual designers always have

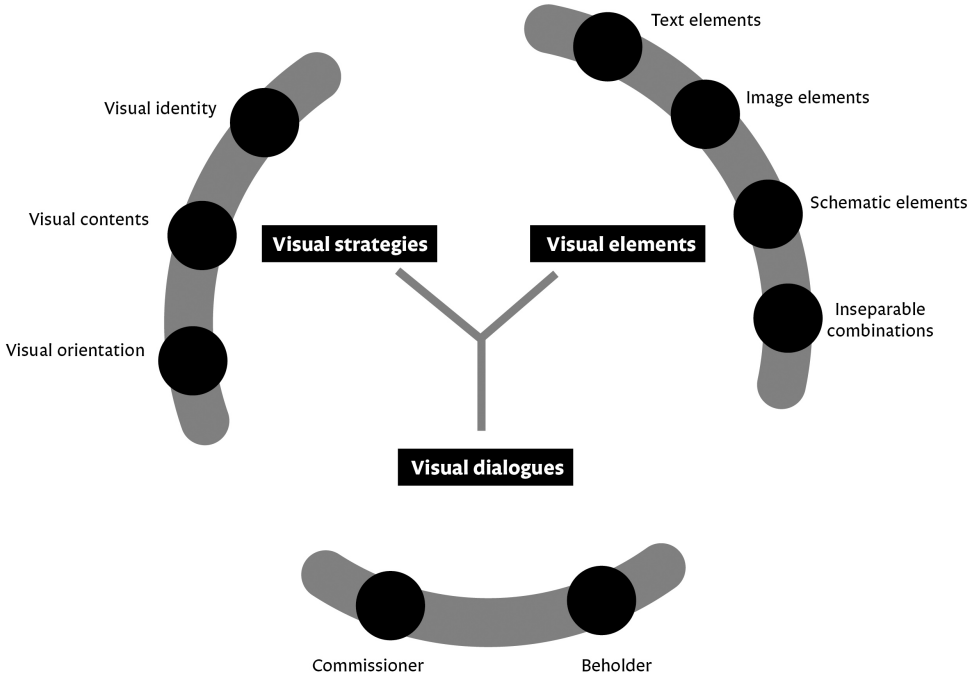


FIG 1.
Concept Development

Graphic designers develop visual concepts through a simultaneous consideration of visual elements, visual strategy and visual dialogues. This process aims to combine these three forms of visual argument into a single, all encompassing 'idea' or 'concept.'

to consider a combination of these three aims when they develop a visual strategy.

ACTIVITY 3 _____ **CONSIDER THE DIALOGUE BETWEEN COMMISSIONER & BEHOLDERS.**

The third activity of visual designers is to consider the positions of commissioners in relation to the people they want to communicate with. Visual designers make these positions visible.

All three activities are considered together, and all influence each other continuously. FIGURE 1 illustrates this. For example, making a decision about a typographic element will have consequences for the visual strategy and the visual dialogue. And the other way round is considered too. Decisions about the positions of a commissioner in relation to his/her beholders will influence the design of typographic elements. (Example: Text set in type that is too large makes

a reader looks less competent and makes the commissioner look paternalistic.)

The three activities are directly related to three forms of argumentation. The elements and their combinations adhere to visual logic. Visual rhetoric determines the visual strategy, and visual dialectics provide the background for the visualization of the relation between commissioner and beholder. The results of the interviews with professional graphic designers indicate that graphic design practice can be partly described by referring to argumentation theories. This is not surprising if a main aim of graphic design is to enable communication between commissioners and beholders.

NINE REFLECTIONS

The second pattern that was observed and confirmed during the interviews with visual designers revealed that 'considering the visual configuration' is only a part of activities. Considering a visual configuration forms the main focus and is characteristic, but this cannot be done without undertaking other activities. There are at least another eight 'reflections' necessary to design. These reflections are listed below.

REFLECTION 1 _____ **CONSIDERING VISUAL CONFIGURATIONS.**

This is described in the previous section. This is what visual designers see as the core of their activities.

REFLECTION 2 _____ **PLANNING AND MANAGEMENT.**

Every project has to deal with financial matters, time-management and the organization of activities of different people. This combination needs to be considered through planning beforehand, monitoring during the project and evaluation afterwards.

REFLECTION 3 _____ **PRESENTATION AND ARGUMENTATION.**

Every project must be presented to a commissioner. Presentations must provide arguments why a specific visual configuration was developed and why this configuration would be beneficial for the commissioner. Such a presentation must be considered carefully to contain all the relevant arguments to

persuade a commissioner and make an assessment possible. The same arguments can be used in more public discussions afterwards when a particular configuration needs to be defended in the media, in design-contests or in portfolios.

REFLECTION 4 _____ **EVALUATION AND TESTING.**

The evaluation of a design to establish its effectiveness is a separate activity. This can range from a very informal check with colleagues to a full usability test with tangible prototypes. Also the benchmark tests, as they are described by Sless and Shrensky (*2006*) belong in this reflection.

REFLECTION 5 _____ **MODIFICATION FOR PRODUCTION.**

The production, distribution and implementation must be considered. The opportunities and limitations will influence a visual configuration and need to be taken into account during the process. It is likely that production facilities, distribution channels and implementation strategy will influence a project.

REFLECTION 6 _____ **CONSIDER A SITUATION.**

Designers, commissioners and beholders are active within a larger context. This context encompasses for example languages, financial structures, social structures, political situation and a host of other influences that need to be known and considered before visual information can be developed. (For example, for information about medicines, the relations between governments, industry, doctors, insurances, pharmacies and patients provide a context that needs to be used as a basis.)

REFLECTION 7 _____ **CONSIDER THE PROBLEM.**

Within a particular context, a designer focuses on a specific problem. Selecting a specific problem from a range of possible problems needs careful consideration. For example, visual information about medicines for patients is a problem within the European health care situation.

REFLECTION 8 _____ **CONSIDER A PERSPECTIVE.**

The angle to approach a specific problem needs to be considered too. It is likely that there are many possible approaches

to consider a problem. Technological, economical, esthetic, ethical, sustainable are examples of different angles to approach a problem. For example, if European diabetic patients need information about their medicines, can we use mobile telephones to support this? What kinds of information and how exactly?

REFLECTION 9 _____ **PERSONAL DEVELOPMENT.**

Before, during and after every project, a designer reflects on the value and suitability of a project from a personal point of view ('do I like doing this work?') and from a company point of view ('is this the kind of work that is rewarding?'). This reflection considers if an activity fits into the individual development and/or the development of a company.

Professional behavior is characterized by a swift consideration of each reflection, and frequent switches between these reflections. A design process does not seem to be a linear activity of a number of subsequent and recurrent steps. It is more like a 'web of reflections' in which the sequence of considerations is determined by all sorts of influences such as experience, subject knowledge and skills. [This is based on the ideas of Donald Schön (*1983, 102*) in which he describes a 'web of moves'.]

The starting point in this 'web of reflections' is not set beforehand, and this starting point might differ for various projects. Any starting point is acceptable and could be used: it is likely that any start leads directly to the consideration of other reflections. FIGURE 2 shows this 'web of nine reflections.'

Not all reflections need to receive the same weight of attention and some might be considered to be not relevant for a particular project. However, in each project of graphic design, it is possible to point to these reflections. The time to consider all reflections varies according to the available time. This can range from a few minutes to iterations of days or even weeks. The diagrams make it possible to define 'a professional' as someone who is capable of considering all reflections together.

This preliminary description of two patterns—considering visual configurations and nine reflections—seems to cover the research findings of the investigation into the activities of visual designers in the Netherlands until now.

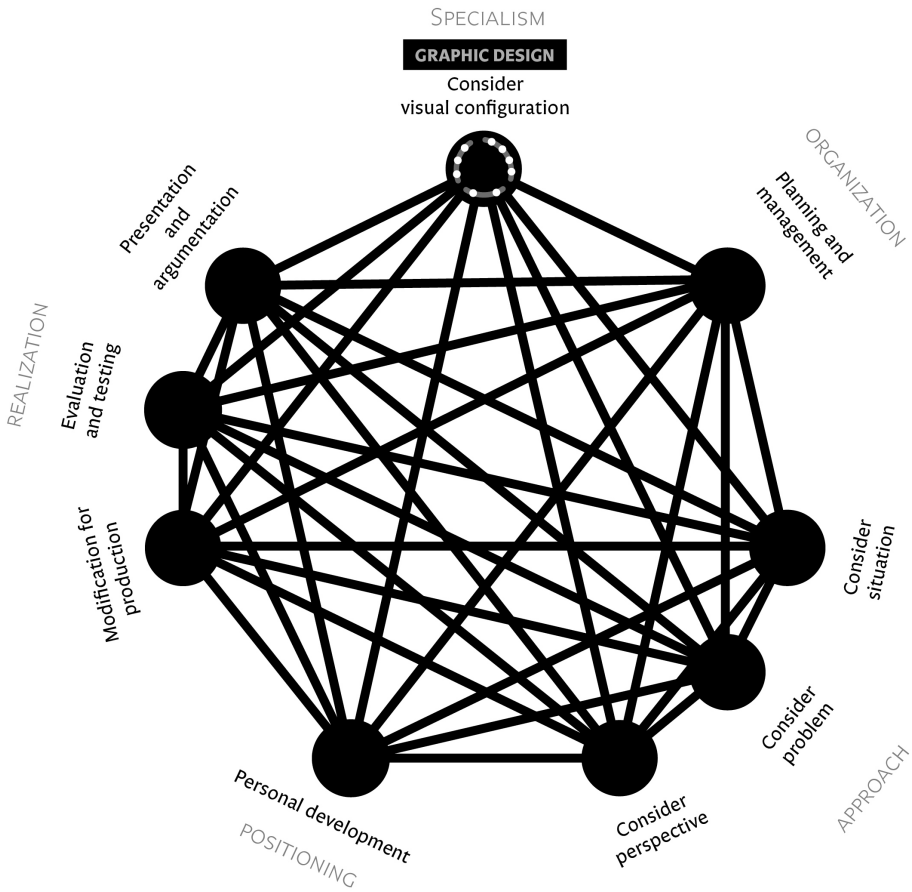


FIG 2.
Web of Reflections

The 'web of reflections' shows the activities of graphic designers that are necessary to make the development of visual concepts possible.

EFFECTS ON EDUCATION

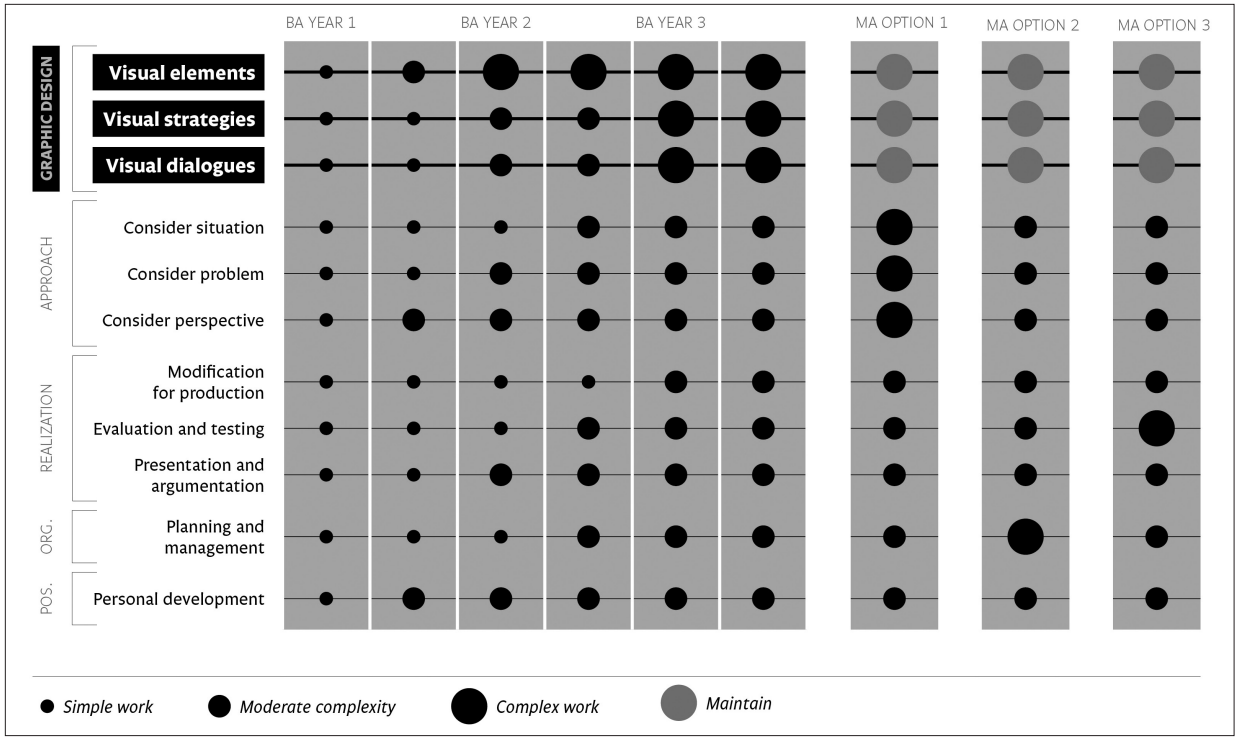
The two diagrams described above could provide a methodical basis to discuss graphic design education. They provide a structure to approach some of the problems that are mentioned in the introduction. Preliminary experiments with the implementation of these diagrams in education are positive, but more experiments are necessary to make sure that modifications can really be seen as improvements.

A brief revisit of the five areas that are mentioned earlier shows how both diagrams could be applied to these discussions.

1 _____ **COURSE CONTENTS AND STRUCTURE.** The diagrams could provide a motivated and gradual development of

FIG 3.
Building Curriculum

The description of graphic design practice into nine reflections offers the opportunity to build a curriculum that introduces professional practice in a progressive manner. This description is independent from genres, media and tools. The focus of a BA course is to learn to consider visual elements, visual strategies and visual dialogues in a coherent way. An MA course can—apart from focusing on a specific medium (packaging, books, diagrams, type-design)—focus on different reflections. The figure shows three examples: a focus on observation of situations/problems/perspectives (option 1), a focus on planning and management (option 2) or a focus on evaluation and testing (option 3).



a three-year BA curriculum (see FIGURE 3). It brings students in contact with the fundamental issues of the profession in relation to the other issues. The limited time and continuously increasing contents of a course can be reviewed beforehand. The diagrams can be used to differentiate between the focus of courses on BA and MA level. This could make the distinctive position of courses clearer.

2 _____ **ASSESSMENT CRITERIA.** This can be related to the diagrams too. All reflections can be assessed separately using criteria and evaluation methods that are appropriate for each reflection. Aesthetics has its place, but it is also essential to assess, for example, project management (REFLECTION 2), presentation (REFLECTION 3) and testing skills (REFLECTION 4). The results of some initial experiments show that it is possible to discuss the visual elements, visual strategy and visual dialogue with students separately and in combination. Each can be marked on its own merits.

3 _____ **RESEARCH.** Practical research, practice-based research and academic research—is directly integrated into the nine reflections. Practical research is essential to reflect on a practical situation or project. Practice-based research is essential to provide evidence for classes of situations, and academic research is necessary to further our understanding of situations.

4 _____ **THEORY.** The diagrams indicate which theories are relevant for practitioners. The nine reflections each have their own theoretical background and so have the three visual activities. Some initial pointers are the literature about elements (typography, photography, illustration), strategy (visual persuasion, marketing, information design, identity design, communication strategies), dialogues (describing different relations between commissioners and beholders). Literature about the visual dialogues —how commissioners and beholders interact,

enabled by visual materials—is still scarce. However, there is plenty of literature about the eight other reflections: project management, observations of situations, problem detection, selecting a perspective, presentation techniques, testing and evaluation, implementation and personal development. The current prevailing dominance of art-history and art-philosophy needs be curtailed in favor of theories about the abovementioned topics. It is clear that this is a very substantial amount of theory and it is unlikely that this could all be covered in three years of a BA study.

5 **TEACHING METHODS.** The diagrams make it possible to relate the teaching method with the educational aims of the different reflections. For each reflection, it is possible to determine a combination of training and learning. The diagrams make clear that the dominance of a master-student model needs to be challenged and replaced by a range of teaching methods that suit the different reflections.

6 **ETHICAL QUESTIONS.** In addition to the five points that were mentioned in the introduction, the diagrams can be helpful to discuss ethical questions. Each reflection incorporates an ethical component that needs to be considered in every practical project. These are questions about visual elements (Am I allowed to use this typeface? Could it harm people if I portray them like this? Does this chart really reflect all data?), visual strategies (Is this a suitable identity for a commissioner? Is the information contents correctly represented? Does the structure lead or mislead the beholder?) and visual dialogues (Does a design really enable an appropriate dialogue between commissioner and beholder? Which beholders are excluded by this format?). The same approach seems to be applicable for questions about the eight other reflections.

It is clear that graphic design education must change, probably radically and probably fast. Both diagrams might be part of the discussion about these changes. Still, it is essential to be very careful, and experiment and test alternatives thoroughly first before implementation.

ACKNOWLEDGEMENTS

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Jorge FRASCARA & Guillermina NOËL

WHAT'S MISSING IN DESIGN EDUCATION TODAY?

ABSTRACT

This article begins by describing a desirable design approach that is only practiced by a few designers today. This design approach is desirable because it responds to a society that suffers from a number of illnesses due to communications and artifacts that do not satisfy the needs of people. The article then proposes the kind of design education that could lead to forming designers within the outlined approach, and defines necessary terms and conditions. Lastly, it proposes recommendations, and the need for a deep reflection on the nature of design and of design education.

"Imitation is not really a reliable strategy to arrive at excellence in design or design education."

THE DESIGN APPROACH WE NEED

Before talking about design education, we must envision design as we would like it to be.

We propose a design that, responding to real needs of society, could generate visual materials that meet the needs and abilities of their users. Society needs forms that employees in a business could use effectively, that tax payers could fill easily; or that hospital physicians could use without resulting in dangerous medical mistakes. We need signage that people in general and seniors in particular could understand and follow easily; teaching aids that could actually promote learning. We need transparent websites, easy to navigate and confusion-free; interactive programs not oriented to using the latest technological gizmos, but oriented to helping people do what they want to do. We need health education for the general population that could be clear enough and persuasive enough so that people could live healthier lives on the basis of making better-informed decisions. This is the kind of design we need. This is a design that fosters equality of access to the benefits, services and opportunities that society can offer. It is ethical design, one that recognizes the different profiles of users, accepts those differences and responds to them. To perform this function design has to be user-centered, evidence-based and results-oriented.

First, what does user-centered mean? It has to be a design built around the user, with the user and for the user. It is not design that seeks originality: originality has to be a consequence of good design work, it cannot be the objective of good design work.

Second, why evidence-based? It has to be a design that uses available knowledge as a launching pad. There is a lot of information in social sciences and design journals that is directly relevant to a human-centered design approach, particularly in cognitive and perceptual psychology, but also in educational psychology and anthropology. Design decisions cannot be based on hunches, but on available or new knowledge about human cognition and behavior. The design we need is not about looks, it is about people.

Third, why results-oriented? The reason why at a certain point someone decides that design is needed is because a reality has to be changed. If something has to be changed, one cannot design what one believes is a solution and walk away assuming that the solution will actually work. One has to wait, watch and evaluate the results achieved. The building of exquisite instruments is not the aim of the design we need, the aim is the change for the better in the reality we face. If 33,808 people died in motor vehicle traffic crashes in 2009 in the USA, and about 2.2 million were injured, the measure of good design action would be to visibly contribute to the reduction of deaths and injuries. Nothing more, nothing less. Cute slogans and smart images do not matter if the statistics remain stable. Someone might say, "Well, this is too high a bill for design, a multi-agency action is needed." Right, but who is going to plan that massive multi-agency action? In final analysis, it is a communication problem, within agencies, between agencies and between the agencies and the public. This involves a multidisciplinary approach to design that includes perception, cognition, persuasion, strategic design and information flow management; all provinces of communication design.

To promote this sort of user-centered, evidence-based and results-oriented design in departments of design around the world, we need to develop and teach appropriate conceptual and practical tools, and educate students in those tools so that human needs and wishes—and even emotional, cultural, cognitive or other flaws—could be addressed. To do this, we need a multidisciplinary design education. We should as well evaluate society's needs and priorities, so that young designers not only become able to work using sophisticated methods, but also become able to apply their research and design skills in fields of utter importance, such as health, education, peace, security, eating habits, financial management and environmental preservation.

Within this framework, we propose the following components for the design education we need, right now.

THE KIND OF DESIGN EDUCATION WE NEED: THE USER, THE EVIDENCE AND THE RESULTS AS KEY FACTORS

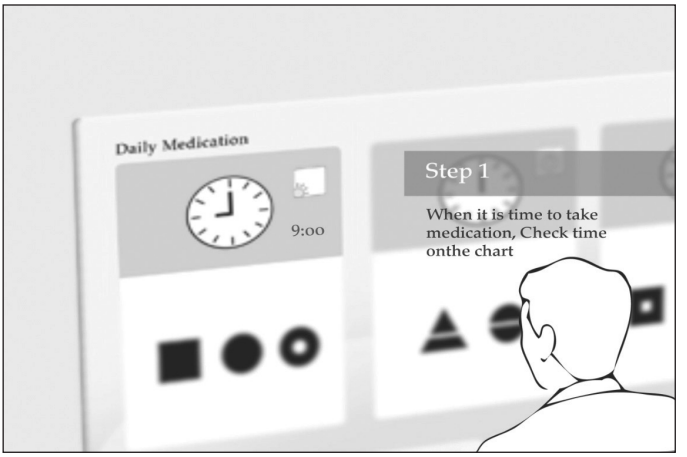
In addition to the topics we believe design education should pay attention to, it is necessary to embrace a system-level change in thinking. The present state of affairs will not be improved by adding a course on user-centered design or another on research methods. There is a

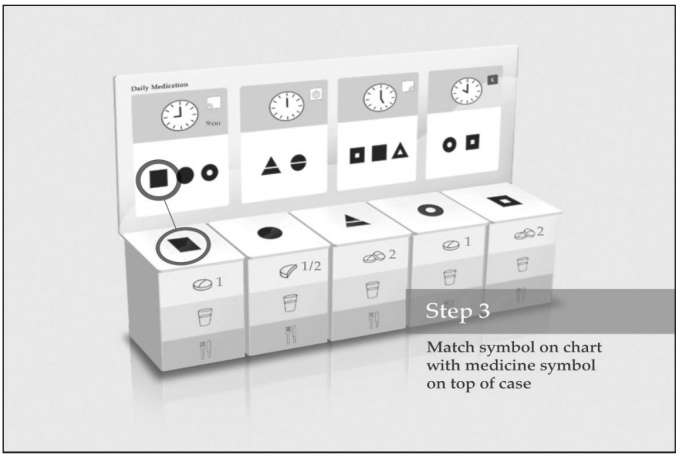
> *...need to change how we orchestrate the sequence of experiences in design at the department level and there really needs to be a core philosophy of how young designers need to be educated. (Karen Schriver, personal communication, 9/12/2011).*

Although we present the following three aspects separately, in reality they are intertwined.

The User

For many years professional practice and writing about design have been discussing the central role of the user for the work of the designer. User-centered, human-centered, participatory design... several names are given to approaches that include the user in the design process. Are schools responding to this? Not that we know. Most schools keep on exclusively trusting the judgment of the instructors when it comes to evaluating the work of the students. Similarly, in design practice, competitions trust the judgment of experienced designers to define the quality of submissions. But, what kind of quality are we talking about in both cases? Visual quality? What is "visual quality" if it is not contextualized within a purpose, a situation and a public? Perhaps it is aesthetics in regards to prevalent trends? What do trends have to do with the capacity of an old man to understand a pharmaceutical leaflet, a tax payer trying to fill a tax form, a person trying to use an emergency exit door, or a child needing to learn how to read?





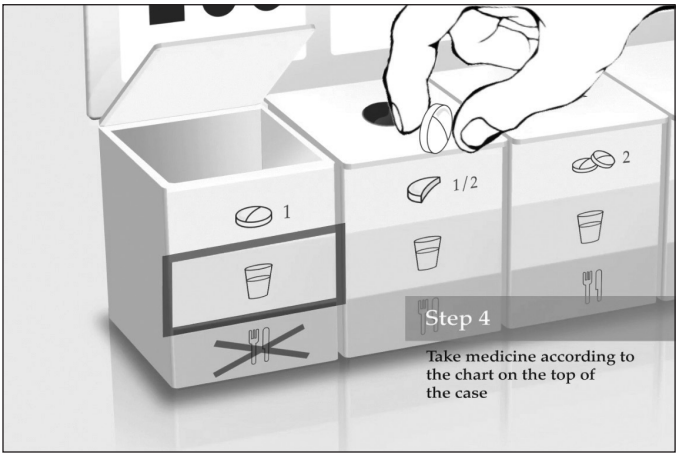


FIG 1.A, B & C

Three stills of a 50-second animation made to explain to persons with aphasia how to use a pill dispenser.

ANIMATION
Taewan An.

RESEARCH
Taewan An, Christine Jones and Cathy Socci.

FROM
J. Frascara and G. Noël, User-centred Graphic Design Workshop 2009, Philadelphia University of the Arts, USA.

Five different projects were developed by teams of students in five days. Users were interviewed during the development of the workshop to react to prototypes and provide additional feedback (*Frascara and Noel, 2009*).

The users have to be called in, we hope, in the near future, to help students complete the communication design equation, to stumble into the users, to see them from close quarters, confront their complexity, their needs and their differences (*Frascara and Noël, 2009*).

The user can help identify problems and can also help evaluate the design of prototypes. To be able to evaluate the performance of a design product when it is being used, we need to learn ethnographic observation methods, capitalizing from the many years invested by anthropologists in the development of approaches to the observation of life as it unravels. We have to train students in note-taking, and in the analysis and organization of field notes to arrive at the generation of insights that could direct the design efforts on the basis of intelligent perceptions obtained from real life.

Learning is promoted when learners are engaged in solving real-world problems (*Merrill, 2002, 45*).

The Evidence

A lot has been written about perception and cognition in the last century. Much of this work we find essential for the development of our work as designers of written documents. The existence of this wealth must be brought to the students. Otherwise, how can students arrive at decisions concerning type size, line length, size of margins, or levels of contrast, without considering the kind of reading task, the complexity of the text, the reading distance and several other dimensions that affect the performance of people in front of different typographic layouts? Evidence-based design helps the designer make dependable decisions concerning many variable possibilities, and it also provides the designer with strong arguments to defend solutions.

Readings in perception and cognitive psychology are sadly missing in school, and layout decisions are made on the basis of "best practices." These "best practices" might be the best, but might also be not good enough. Imitation is not really a reliable strategy to arrive at excellence in design or in design education.

Mastery of the existing information about design is necessary, but we must also be aware that every design problem has specific features, and that existing knowledge often cannot be just mechanically applied, without adjusting it to the specifics of

different situations. For example, there is no universally true best way to communicate medical information visually, if we do not know what we will be communicating, who would be the reader, where is it going to be read and for what purpose. Here is where evidence derived from existing information must be complemented by the development of new information. Here is where the need arises for field research, for the design of tests, and for the creation of situations of use that could help the designer create the information that the readily available knowledge did not cover. Here appears the need for a whole range of research methods.

The Search for Results

The fundamental significance of visual communication design is not in the construction of communicational systems, but in the impact that those systems have on people. This impact may affect knowledge, attitudes, feelings or behavior, and it represents the reason why the design action came about. If we concentrate our efforts on the grammar of the system of products as an end in itself, if we evaluate the potential performance of the system on the basis of suppositions, and if we walk away once the communication plan is implemented, we will never know whether it worked or not, nor why it went right or wrong. Keeping the need to measure the results as an explicit aim, and devising the intermediate objectives and actions with a view to achieving those results, is the best way to make sure that design has a place in society. Design would get noticed by more of the public if there were some objective evaluative criteria brought to bear in talking about everyday artifacts of design.

To talk about a results-oriented design approach is to talk about the need for systematic evaluation methods. To be able to evaluate, it is necessary to begin with the establishment of measurable objectives, that is, objectives that, within reason and on the basis of available experience can be achieved at a given level. If one needs to evaluate, then it follows that all the steps of the plan have to be explicit, and all efforts have to be oriented at designing the steps that could take the design effort to the desired end. If our activity is not centered on results and cannot, within a certain degree, guarantee them, design will never be regarded as a profession, but as an art or even a craft.

DESIGN EDUCATION: OTHER INDISPENSABLE AREAS TO BE DEVELOPED

The Client

Designers do not work alone. They always have a client that commissions the work. Clients and designers should be partners, each contributing knowledge and experience to the success of the project. Clients cannot be absent from the education of designers, and designers need to acquire negotiation skills in school, in order to be on the same level with clients. Lester Karrass dictum "You don't get what you deserve, you get what you negotiate," could be applied to many fields, but it's certainly true for the relation designer-client. This is not exclusively connected to the collection of fees, it is connected to every important decision related to the development of the project. Negotiating skills are not something that design schools can leave out. As an employee in a large design firm, or as a free-lance designer, negotiating skills are always needed (for a case study of the rhetoric of design, see *Schriver, 2011*).

Nothing can replace real clients, real jobs, real problems. Similar to the practice of medicine, design practice involves the knowledge of a body of generic information that has to be put to work for the solution of a specific problem. Acquiring the general knowledge is a scientific effort. Using that knowledge requires a different, but complementary, set of skills: listening, observing, judging the elusive qualities of the specific situation and selecting specific actions. Nothing can replace the feedback a young physician gets when practicing in the emergency room. Similarly, nothing can replace the feedback a young designer gets when working with a real client and listening to real audiences. Without developing these important skills of negotiation, observation and evaluation, we will keep on hearing designers complaining about not being sufficiently respected in society (like lawyers or physicians are).

The Text

Almost all communications involve text, and when it comes to scientific, educational, instructional or technical information, more often than not, text is at the center. We need schools forming

designers to manage textual information, maybe working in collaboration with technical writers. Text is not only there for designers to manipulate its visual presentation: we need to form designers able to analyze content, and organize it under the light of theories of reading, of learning and of cognitive psychology (*Wright, 1978*). We need to form designers able to critically analyze what is being said, why it is being said, what is the purpose of the textual communication, who are the issuers of the communication, who are the readers, and which would be the reading situations. Discussing purpose, Karen Schriver recognizes four common possibilities:

> *1 _____ reading to enjoy,*
> *2 _____ reading to assess,*
> *3 _____ reading to do, and*
> *4 _____ reading to learn to do*
> *(Schriver, 1997, 290).*

With this on hand, designers need to evaluate all factors and decide in what way each one conditions the final design. One cannot learn to design a brochure with dummy text; dummy text serves just to take care of the cosmetic aspects of design. If design is to be communication design, and not only visual design, then it follows that we are responsible for the quality of the communication and should do our job.

The Presentation of Text and Images

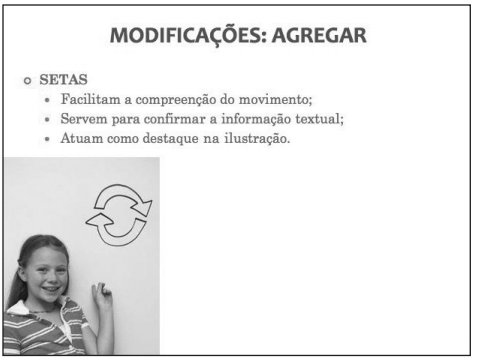
Images can have different functions, but whatever the function could be, they should be connected to the objectives of the project. Lots of design projects include images because the kind of work in question normally includes images. However, image inclusion in any project needs to be critically analyzed. Many times educational aids include images that are more distracting than conducive to learning (*Torcasio and Sweller, 2010*). The same happens in health information materials for older adults, images can distract, instead of helping understand the information (*Griffin and Wright, 2009*). And then, if it is decided that images are needed, it remains to be decided what kind of images need to be selected or produced, as much in

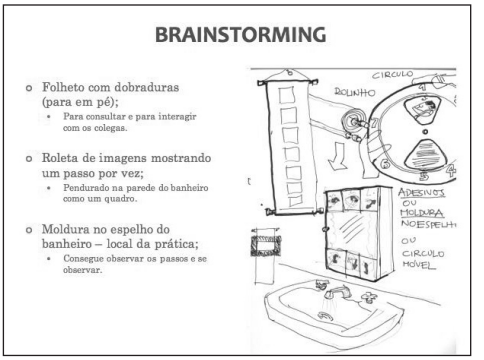
content as in visual presentation, so that they contribute to the aim of the project.

The relations between texts and images has received much attention in the last fifty years, and has been particularly intensified with the development of distance education in the 1960s and with multimedia electronic presentations in the recent past. The articulation of the relations between texts and images as part of the need to help understanding, remembering and using complex information, is a topic that seldom appears in design schools (*Mayer, 2005a; Mayer, 2005b*). Design schools usually concentrate their attention on the visual integration of texts and images, but do not normally make the students hinge their decisions on the perceptual, cognitive and motivational impact of the relations established. The topic does not even enter the discussion. Real projects, with real users, that could show their responses to the design solutions in terms of understanding, learning, remembering and using the information, could be more eloquent for the students than endless abstract discussions or lectures.

The Visual Dimension

Education in the visual dimension is extremely important. But it is not important in and of itself. Many times people at public lectures ask what is more important in design: aesthetics or function. This is not an "either-or" situation: aesthetics is a function in design. Like any other aspect of design, the aesthetic dimension is to be constrained by all the requirements of the design in terms of purpose, public and so on. It is not advisable in our view to foster the development of a personal aesthetic by the design student. The blatant presence of the designer in the solution is not to be welcome. "An example from music clarifies the point. According to an article published a few years ago by the *New York Times*, a major problem for the then newly appointed conductor of the Philadelphia Symphony Orchestra was to persuade the musicians that the orchestra was supposed to be concerned with quality, not with identity. The previous conductor had tried to develop a distinct style during his time in charge. The central problem, the new conductor argued, was not to obtain a 'Philadelphia sound,' but Haydn's, or Beethoven's,





or Stravinsky's, or whoever the composer to be interpreted might be" (*Frascara, 2004, 5*).

Aesthetics is important because it provides the first encounter between the public and the design. Choosing the wrong aesthetics could make that first encounter fail, and the possibility for communication collapse. The knack of the designer is to be able to master different aesthetic systems, "speak in tongues" one could say, and realize where his/her limits lie.

In the case of information design, leaving aesthetics aside, visual sophistication regarding decisions that affect the presentation of information is indispensable. In relation to the presentation of text, it is what Robert Waller calls "macro punctuation" (*Waller, 1980*). A designer must be able — through testing, interviewing and observing users — to diagnose what is visually wrong with an artifact, and also why, and how to fix it. Visual sophistication means here the capacity to make distinctions that are significant for performance, and to have the resources for the creation of optimal solutions for the visual presentation of information. Layout affects comprehension (*Wright, 1999*).

Important as well is the ability to present information as diagrams, charts, drawings or any other non-verbal way, when it is deemed that this way will perform better than plain text, or that it will complement text well.

Lastly, educators need to have an idea of the designer they need to educate. Without this overall conception, and the competences and skills implied, it is not possible to design a curriculum and to evaluate the progress of the students.

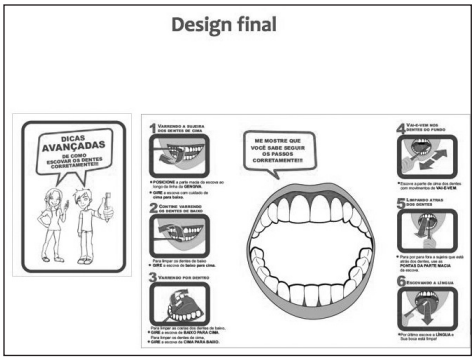
FIG 2.

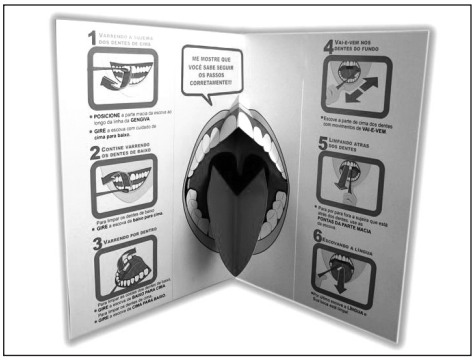
INFORMATION DESIGN
teaching dental hygiene to 9-10 year olds.

Left to right:
2a User involvement.
2b Brainstorming.
2c, 2d Final designs. José M. B. de Souza, Thiago Alves Faria y Mayra Laska.

FROM
J. Frascara and G. Noël, User-centred Graphic Design Workshop 2010, Universidade Positivo, Curitiba, Brasil.

Five different projects were developed by teams of students in five days. Users were interviewed during the development of the workshop to react to prototypes and provide additional feedback.





SOME USEFUL DISTINCTIONS

Teaching & Learning

Teaching involves engaging students with experiences that enable them to learn. Learning involves the acquisition of information, but also the development of learning skills. The information provided must be up-to-date, rich, accurate and relevant, and cognizant of the prior knowledge of the student. The skills must be those relevant to long-term educational objectives. Transmission is connected to teaching and discovery to learning. Both are fundamental in the educational process. Students should be taught, but they should also be taught how to learn on their own, from observing reality, from consulting the literature and from others (*Frascara, 2006*).

Primary Learning & Deutero (secondary) Learning

There is a primary learning, connected to the acquisition of information, that is conscious; and a secondary learning, that relates to the development of basic skills, and is an automatic and unconscious effect of primary learning. If I learn how to plan a project carefully, I also learn how to plan anything carefully. If I learn a foreign language, I also get better at learning foreign languages. Secondary learning should guide the planning of educational programs: it is necessary to identify the basic skills that the students should develop (Simlinger, 2007), rather

than to mechanically line up a series of projects oriented at transmitting whatever information, or at imitating professional practice.

To Instruct and to Educate

To instruct relates to training. To educate is to foster the development of judgment, personal initiative and the adoption of values. In order to be a good designer, one has to be a good citizen, a socially responsible person. For this, instruction is not sufficient. Instructed students who do not simultaneously reflect on the value of the acquired instruction, or do not integrate that instruction within social value systems, tend to become imitators; they cannot really become educated professionals.

The Levels of Design Education

Undergraduate programs are there to form students so that they can enter professional practice at a junior level. Master programs should guarantee that the students master the state of the art in the field of their choice. Doctoral programs should produce theses that expand the knowledge of the field. One level is not to be the continuation of another, as it is often witnessed: it should not be "more of the same." The levels are intended to be of a different nature, and must have clearly distinct objectives.

The Problematization of Learning and Education

If design programs are to cultivate the next generation of design educators, they should provide the necessary knowledge in educational theories and methods. Similar to the practice of communication design, the important issue in education is not what one communicates, but what the students understand. Indeed, educators need to develop pedagogies that meet students where they are, and provide the right conditions for scaffolding their knowledge and helping them to reflect on what they learn (or do not learn). Design educators need to pay attention to the vast tradition of educational reflection, at least at the level of the most basic principles (Merrill, 2002). A link with faculties of education would be fitting, if design schools aimed at forming true

design educators, instead of hiring their own graduates as a way of perpetuating existing approaches (*Winkler, 1997*).

SUMMING UP

Recommendations:

1 _____ INCLUDE THE USER in design education.

2 _____ INCLUDE THE EXTENSIVE DESIGN-RELEVANT BIBLIOGRAPHY produced by the social sciences and other disciplines, for the development of an evidence-based design approach.

3 _____ INCLUDE INSTRUCTION ON RESEARCH METHODS, beyond bibliographic research.

4 _____ INCLUDE INSTRUCTION ON EVALUATION METHODS.

5 _____ INCLUDE INSTRUCTION ON WRITING AND READING.

6 _____ CENTER EDUCATION ON THE DEVELOPMENT OF COMPETENCIES, not only on the acquisition of information.

7 _____ FOSTER THE DEVELOPMENT OF AN ALERT ATTITUDE to observe reality, learn from it and find opportunities for meaningful design action.

There is an urgent need to include the social function of design, that is, to teach a design that could assist people in their daily needs. Design education needs to attend to the interdisciplinary nature of design, where the social sciences, educational psychology, business and computing sciences, to mention the most obvious ones, play important roles (*Frascara, 2008; Meurer, 1997*).

We hope design education could rapidly evolve toward forming the communication designers society needs. We need a new insight, appropriate for our time. We need to engage in reflecting and questioning how we teach, what we teach and what kinds of designers we want to form.

> *"Doubt goes hand-in-hand with uncertainty. And doubting what exists, what one thinks, and what one does is the most important aspect of creative action" (Meurer, 1997, p. 126).*

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David SLESS

DESIGN OR "DESIGN"— ENVISIONING A FUTURE DESIGN EDUCATION

ABSTRACT

Challenging the common grand vision of Design, this article considers 'design' as a humble re-forming process based on evidence to substantiate its results. The designer is likened to a tinker who respects previous iterations of a design and seeks to retain what is useful while improving its performance. A design process is offered, illustrated with a real project example. The author argues for a reframing of 'design' as a sustainable, evolutionary process.

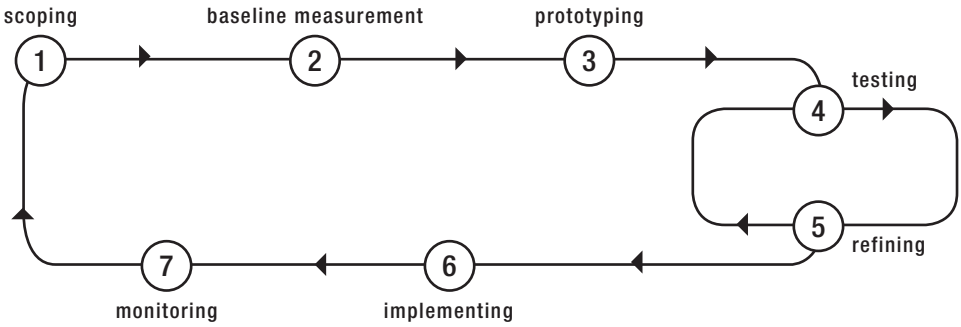
"The Design vision is both dangerous and misleading, when applied to education, as it so often is as a guiding vision. I fear it produces arrogant, ignorant and ultimately disappointed graduates..."

FOR MORE THAN THIRTY YEARS, my research team and I at the Communication Research Institute (CRI) have been examining the principles and practice of communication and design. In particular, we have developed and successfully implemented certain design methods based on a philosophy of communication and on our extensive experience with several hundred large and small organizations (commercial, not-for-profit and public) all over the world. I have noticed, however, that although some of our research findings have been adopted by some practicing designers, design education has remained more or less static for decades. I hope that my paper will help change this sad situation.

FIGURE 1 is one of the outcomes of the research program into communication and information design methods conducted at CRI between 1985 and 2012 (*Sless, 2002*). It may be relevant to design in other fields, but I would defer to specialists in other areas of design on that matter.

FIG 1.

Information design process



The process illustrated in the diagram builds on the work of earlier designers and researchers, particularly drawing on research in *Design Methods* (*Jones, 1980*) and *Communication Theory* (*Sless, 1986*), and pulls together a number of strands of thinking on user experience design, appreciative dialogue, wicked problems and the philosophy of language. It sidesteps postmodernism and much of the contemporary debate about the role of theory in design practice (*Sless, 1998*).

I have come to the view that the process described by this diagram should be at the heart of teaching future information designers. This is the framework within which we should teach the full range of technical, craft, investigative and social skills that are part of our collective and accumulated know-how and research findings in the field. However, to accomplish this—to bring about the necessary transformation in curriculum and teaching practices—will require a rethinking of the design philosophy that currently informs most teaching in communication design, or graphic design as it has been traditionally called.

Much of the detailed description of this diagram and the necessary skills that are needed in contemporary information design have been discussed elsewhere (*Sless, 2008*). I will not repeat them here. Rather I want to focus in this paper on the assumptions and worldview that inform this approach to design education. I will do so, in part, by contrasting it with the dominant view in our time.

NOT DESIGN WITH A BIG D

Though the language used to envision design has changed over the years, and different areas of design give the ideas a different inflection, the dominant dream, project, trajectory and vision of design in the 20th and 21st centuries has not changed.

The dream was long ago encapsulated by László Moholy-Nagy, writing in the 1930s:

> *Design has many connotations. It is the organization of materials and processes in the most productive, economic way, in a harmonious balance of all elements necessary for a certain function. It is not a matter of facade, of mere external appearance; rather it is the essence of products and institutions, penetrating and comprehensive. Designing is a complex and*

> *intricate task. It is the integration of technological, social and economic requirements, biological necessities, and the psychophysical effects of materials, shape, color, volume, and space: thinking in relationships (Moholy-Nagy, 1938).*

Here is both the humility and hubris of the dominant design dream in our time: humility in the face of the complexity of elements that make up our world, and hubris in the belief that through design we can successfully reshape our world and achieve a harmonious, penetrating balance comprising all the elements. This is not just a vision of design, it is a vision of Design.

I suspect that many of my colleagues, though using different language, would see this vision of an all-encompassing approach to designing systems—a harmonious, penetrating and comprehensive balance of all Moholy-Nagy's elements—as the way forward in design and design education.

For a while, I too embraced this vision, this panacea. But I now recoil from it. To understand my vision for the future of design education, I must explain why I have rejected the all-encompassing Design vision.

As a researcher, I collect evidence about the effectiveness of design. The evidence does not support the Design vision. Such ideals, dreams, visions of panaceas, are, to a limited degree, sustainable within the limits of a picture frame, a piece of paper, or a single solid object—a poster, a kettle, a building. But once we move out of this narrow frame, our capacity to create order and achieve that penetrating, harmonious balance is severely tested, if not destroyed, by two things: our own position within an already established personal and social frame of reference, and the sheer size and complexity of our world.

The idea that design can do great things, encompassing ever wider fields of interest and complexity, is implicit within the Design vision. But in what way does a designer shape the world harmoniously? Let me suggest some scenarios. In the unlikely event of a designer being invited to participate in designing a constitution for a new nation, what could constitute a design that created harmonious, penetrating and comprehensive balance and order? What about in the more likely events of being asked to design a city, a shopping complex, an advertising campaign, a website? The reality, not only of large-scale projects but even of

many smaller ones, is that they are compromises with less than fully harmonious outcomes, often over budget and over deadline, and almost never without unintended consequences. In user-centered design, where evidence is often collected on design usability, there are always less than perfect outcomes.

The Design vision is both dangerous and misleading, when applied to education, as it so often is as a guiding vision. I fear it produces arrogant, ignorant and ultimately disappointed graduates: arrogant because many will want to believe in the vision splendid and their role within it; ignorant because it starts from assumptions that are not based on any evidence (indeed, the search for evidence plays no part in Design); and disappointment, because the end result will be—well, disappointing.

From where I see design, I see no grand vision. On the contrary, I believe that most of what we designers do is tinker. We are the travelling tinkers of our time. We temporarily fix things—sometimes quite large things—and we sometimes leave them working and looking better than when they were handed to us for repair. We sometimes make new things to fill a need; a tinker can turn his hand to fashioning a lid for a lidless pot. Designers produce prostheses, sometimes very effective and beautiful ones that are much admired, but prostheses for all that.

Is what we do important? Yes, I think it is, and I do believe that we bring something unique into human endeavours, possibly vital and essentially different to other types of endeavours. But we need a much humbler starting point.

DESIGN AS RE-FORMING

Rather than the Design vision, I would suggest a different starting point, with a different purpose, different criteria of success and probably a different aesthetic. Instead of the grand transformative agenda of Design, I propose a more modest design agenda: *doing considerate and useful evidence-based work to help with gradual well-informed and sustainable improvements, taking account of those areas that we can take account of, and doing no harm*. In this vision, creativity is no longer at the center of the design enterprise, but rather to be treated as a useful part of the armory for designing information. Far more important is being mindful of all those

who have or may have an interest in valuing what has already been created.

I realize that this agenda switches off any notion of what I regard as the radical pretentions of Design to be revolutionary and transformative, and replaces it with design as a *re-forming* activity embedded within the existing social and natural systems.

In a very real sense *re-forming* designers are concerned with re-forming; taking an existing form (a design that currently exists) or generating a new design using an existing or close genus, analyzing it in depth, finding evidence for its strengths and weaknesses and using that evidence to *re-form* it into something new and hopefully better. Whether it is better or not is also a matter of evidence.

This is a sustainable evolutionary design process. It starts from the proposition that the domain in which we might wish to bring about change is already suffused with people and groups who may be interested in what already exists and who may well have an interest in what might replace it; there are always legal, technical, economic, social and environmental factors and interests to consider before we take a tentative step into the future.

In the design process described here (FIGURE 1), the designer should spend considerable effort (about a third of the project budget) at the early scoping stage, discovering the interests and constraints that exist in the problem domain. Such an effort is essential if designers are to avoid the disappointment and frustration that will inevitably follow if the scoping stage is omitted.

One of the lessons from this type of work is that there are multiple foci of interest from which to see any particular design; emphasizing one of these to the exclusion or others, especially the user in user-centered design, leads to a massive distortion of the process and outcomes. Bringing the potential users of a design into the design process, so that anything that emerges serves their interests too, is a laudable contemporary aim. But there are already many others already seated at the decision-making table. The user is just one more voice, and for some around the table, a new and strange voice to listen to and consider. Designers themselves are just another voice at the decision making table—and few designers ever occupy the chairman's seat or have a casting vote.

Whatever the fervor and commitment of the designer to the interests of the user, the reality is that those already round the table will have a powerful say in the outcome. Viewed from this perspective, and as most user-focused designers will reluctantly agree, user-centered designs fail in part or in whole because other more powerful interests prevail. Complexity apart, this is why the Design vision is unrealizable in practice. We need to proceed from a clear recognition of our own position at the table. It is time to alter the focus and avoid the disappointment. The scoping stage is therefore essential.

NOTHING IS TOTALLY NEW

No problem or its solution is totally new. However inadequate a current state of affairs may be, attempts at its amelioration have always been made, long before we as designers are invited to help. These attempts must be measured. This happens in the baseline measurement stage (FIGURE 1).

The baseline measurement is one of the ways we value, cherish and learn from the work done by others before us. It helps us to avoid wasting good work that has already been done and helps us to avoid repeating past mistakes. It also provides us with data to demonstrate, at a later stage, that our improvements have made a useful difference.

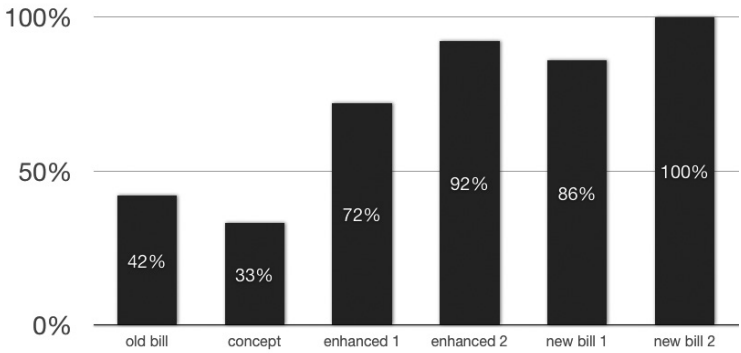
The dataset shown in FIGURE 2 below is taken from a highly successful award-winning project in which I was able to use this approach (*AGDA, 2004*). I have deliberately chosen a project that resulted in a paper output, providing a better sense of the process than is possible with digital systems such as websites, which are potentially much more complex.

The project was for Telstra, the largest Telco in the Australian market, with over 9 million customers when the project was undertaken in 2003. In 1988, I had used an earlier version of the reforming design process to develop a new bill for Telstra (then Telecom Australia) (*Sless, 1992*). The 'old bill' mentioned in FIGURE 2 was that bill, though modified over the years to accommodate new services and changing business requirements.

In 2003, Telstra wanted a new design. Before approaching me, they had instructed one of their agencies to develop a new bill, which Telstra named the 'concept' bill. At this point CRI was invited

FIG 2.

Dataset collected from successive designs of telephone bill



to conduct a review of the concept bill. I suggested that we test the usability of the concept bill and compare it with the usability of their current bill (the 'old' bill). In collaboration with Telstra, we set a minimum target performance level for the bill's usability then tested it with a sample of their customers. The results showed clearly that their then current bill (the 'old bill') actually performed better than the concept bill (see the first two measurements in FIGURE 2).

These performance measurements, taken at the baseline measurement stage of the design process, crucially framed everything that followed. At this stage, about a third of the way through the project, no work had been undertaken to develop any improved or new designs.

Erring on the conservative side, Telstra asked us to improve the 'old bill.' This led to the 'enhanced 1' and 'enhanced 2' designs, which when tested, proved to perform far more effectively than the first two designs.

At this point, Telstra (and CRI) decided that an enhanced old bill dating from the 1980s would not meet their current position in the market place, so the organization asked us to develop a new bill. Because we had a substantial body of data on how people used the old bill, we were able to move rapidly to a new prototype that was then refined in one more round to give a result where all the people tested were able to use the bill at an acceptable level.

It is important to note that an acceptable level does not mean a perfect level of usability. It is also important to note how the whole process is anchored in evidence, both before and after the design was finalized and before it was implemented.

But even with all of that evidence, and a clearly described process, at least half the work undertaken to bring this project and others like it to fruition are not shown in FIGURE 1. This is the all-important political work of successfully managing the interests that come to bear on such a project. It happened in this particular case to be an internal Telstra staff member who managed this project through the labyrinthian maze of internal interests, any one of which could have derailed the project. If you added up her time as well as our own in assisting this management process, then the total of this necessary work came to about fifty percent of the total project effort. In our experience, this is fairly typical (*Sless, 2002*).

The remaining question is whether or not the design community can come together to change the current educational programs for the next generation of designers so that there are designers who can undertake this type of evidence-based, politically grounded, sustainable work (*Sless, 2011*).

Can we persuade design educators away from their heroic and romantic aspirations and give the next generation a new, more modest sensibility and practice as I have suggested? I would like to think we can, for the benefit of the students and the fragile world we inhabit.

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Audrey BENNETT

GOOD DESIGN is GOOD SOCIAL CHANGE:

ENVISIONING AN AGE OF ACCOUNTABILITY IN COMMUNICATION DESIGN EDUCATION

ABSTRACT

Using typography as its exemplar with its lack of clear performance criteria, this article questions what is good design and how to measure a designer's accountability. Evaluation criteria are teased out from various perspectives: credibility, ease of use, stakeholder inclusion in the design process, respect for cultural dimensions and whether it adds to humanity and/or the environment. The article concludes with steps to social change.

"We should evaluate design outcomes on their positive or negative impact on society instead of only their imagined potential to bring about social change or their formal aspects..."

WITH THE EXHUMATION OF SOCIAL-CONSCIOUSNESS (see *The First Things First Manifestos of 1964 and 2000*) and the steady rise of user research and interdisciplinary research collaborations in the discipline (*Frascara, 1997; Laurel, 2003; Bennett, 2006; Poggenpohl, 2009*) many communication designers may find themselves in dialogue (or sometimes heated debate) with lay people, professionals from other disciplines, or interdisciplinary students regarding what constitutes good design; and, this dialogue may become adversarial when the communication designer's formal values collide head-on with the functional values of others who are unfamiliar with, opposed to, or not persuaded by the discipline's old, steadfast rules for form. I had a recent opportunity to observe such a phenomenon when I was a spectator in a listserv discussion between interdisciplinary designers where the aforementioned design rules came under fire after their alleged misuse in the design of a university's webpage. The following is an excerpt from the beginning of the rather lengthy discussion:

CONTRIBUTOR 1 _____ [Someone] sent out a job announcement for [a university]. I've been advising another campus [of this university] on design, but I didn't realize [it also] had a design department so I thought I would check out their webpage... [B]elieve it or not [the university] teaches communication design, but you would never guess it from their website. [W]hy do graphics and communication designers love tiny, tiny type? Especially communication designers, who one would have thought would like their stuff to communicate. I have never

seen such small type on a website for the main message. There is one good side. Most graphical designers love to use gray letters on a gray background, with small font. At least here we have black on white. Moral: Never send anyone to study at [the university]. That design department doesn't get it.

CONTRIBUTOR 2 _____ I think you missed the gray flock of tiny flying birds meandering through the page? I think that more than makes up for the small font size...

CONTRIBUTOR 3 _____ It's easy to begin to criticize an effort like this based on issues [CONTRIBUTOR 1] raised re[garding] readability and legibility (which com[munication] design students are supposed to at least learn about early on in their studies), but then you can move on to discussing why it's probably a bad idea to construct a site like this one using Flash, which triggers critical dialogues that can lead to meaty discussions re[garding] actor network theory and how it could be very effectively used and has been used to frame criticism of an interactive construct such as this.

CONTRIBUTOR 4 _____ 'Why do graphics and communication designers love tiny, tiny type?' I know the answer to this one. It makes it easier to make the page look neat. My old typography tutor recommended as a get out of jail card with tricky layouts, to take the type down a size. It gives you more white space to play with, and white (or empty) space is the most important tool you have in creating a layout where there are clear distinctions between different information components. In some case, it can actually improve legibility, as clear space around a graphic object makes it easier to read. Of course, there are lower limits to legible type sizes, but these can be hard to define as hard and fast rules. Egregiously tiny type for styling purposes is of course, always wrong, but digital media puts a question against even that statement: Most web browsers, for example, have a 'zoom' function.

CONTRIBUTOR 5 _____ Yeah, CONTRIBUTOR 1, the type is slightly small. I'm nearly your age and had no trouble reading it plus I could—with the magical press of a button—enlarge things.

And despite my advanced age, I still have the cognitive facilities to realize that the site was aimed at someone slightly younger than I am. Seriously, this is the level of design criticism we get on this list? Gratuitous insults devoid of any questions about intent? Standards presumed but unspoken, letting people lost in the World Wide Web of 1997 whine because they don't make 'em like they used to?

CONTRIBUTOR 1 _____ Obviously I am capable of giving a detailed critique of the [university's] website. To find out what the [undergraduate] curriculum is, for example, one must look elsewhere or download a pdf. But when I find that a design professional violates even the most elementary rule (that type should be readable), I feel that they do deserve a public spanking. Making type tiny to increase white space is silly. [It is also] doomed to fail on a website where one has no control over how the browser will render it. The notion that it is OK to flout usability findings because...you can always enlarge the type, is also wrong...The fact that if the recipient does extra work they can overcome the flaws of poor design is not a very human-centered design approach: it is a very self-centered approach. Finally, the notion that it is OK to use tiny type because, after all, the advertisement is aimed at young folks is also silly and wrong: The goal is for everyone to read it so that some might recommend the position to other people. Good eyesight is not a given, no matter what the age. Many people have vision difficulties, starting at a very early age—even pre-teen age years. Decent designers understand the need to follow accessibility principles which take into account the large number of people in the world who have difficulties seeing, hearing, etc. This is also called universal design. Moreover, it is generally true that following good universal design principles not only helps those with disabilities, but helps everyone (*Norman, et al., 2011*).

Though CONTRIBUTOR 1 distinguishes between graphics and communication design, the ICOGRADA 2011 Design Education Manifesto (*Bennett and Vulpinari, 2011, 8*) uses the key phrases 'communication design' and 'graphic design' synonymously as will this article. The gist of CONTRIBUTOR 1's argument is that communication design can no longer sacrifice readability in order

to paint pretty pictures on the page. The 'meandering birds on the university's webpage' as CONTRIBUTOR 2 notes may not in fact make up for the hard to read type and the hard to access information as CONTRIBUTOR 1 observes. CONTRIBUTOR 4 makes a valid point, though that the hierarchical organization of information elements on the page through variance in point size plays an important role in the overall visual organization and readability of a communication design layout. Still, CONTRIBUTOR 1 implies that communication designers should abandon the old, steadfast rules of white space and small type and focus more on designing for better readability. When CONTRIBUTOR 5 questions the authority of CONTRIBUTOR 1 and demands standards, CONTRIBUTOR 1 offers accessibility as the standard for good communication design.

None of the contributors to this debate are off target in their assessment of the university's webpage. Other design experts agree that:

1 _____ VISUAL STYLE (*Dondis, 1973, 128*) or aesthetics (*Frascara, 1997, 11*) is important to communication design—particularly in regard to attracting the attention of users in order to make them linger to read information and extract meaning.

2 _____ READABILITY AND LEGIBILITY are essential to clear communication (*Bringhurst, 1992, 17; Clair, 2005, 184; Craig, 2006, 63*).

3 _____ HIERARCHY AND SPATIAL ORGANIZATION (including the use of the white space) do indeed improve the readability of a communication design layout (*Lupton, 2004, 94; Williams, 2008, 172*).

4 _____ ACCESSIBILITY is indeed an important consideration to include in the design of an interface that will mediate communication with users with impairments (*Nielsen, 2000, 302; Tidwell, 2006, 288*).

However, to conclude that a communication design outcome is poorly designed based on the presence of small type seems too partial. In the previous excerpt from the listserv discussion, metrics

for what constitutes good design and an objective process of evaluation may have been useful to at least impartially assess the university's website and help the interlocutors find common ground; and, if so, then this raises interesting questions about the potential future of communication design education: How can we teach students to objectively evaluate a communication design outcome's performance and move beyond the subjective and shallow critiques: "I like it." and "I don't like it."? Do we primarily measure effectiveness at communicating as CONTRIBUTOR 1 implores? Or, do we evaluate it primarily for its aesthetic worth as CONTRIBUTOR 2 implies? Do we use theories as CONTRIBUTOR 3 suggests; or, do we factor in social (including environmental) impact? Are there collective metrics that can be gleaned from the discipline's literature; and, if so, do we weigh each of them equally for every outcome?

WHAT IS GOOD DESIGN?

Over half a century ago, curators at the Museum of Modern Art asked questions tangentially related to the previous questions when they curated the exhibition "Useful Objects in American Design under Ten Dollars." In this exhibition they presented objects in use circa 1940 that epitomized what they coined 'good design' (*Rand, 1993 12*). Years later, Thomas Watson Jr., the second president of IBM picked up the good design torch and carried it further. In a University of Pennsylvania lecture he proclaimed that good design is an essential ingredient of good business (*Green, 2011*). His mantra—good design is good business—begot successive mantras from other designers in the discipline: Paul Rand's 'good design is good will' (41) and subsequently Milton Glaser's 'good design is good citizenship' (*Heller, 2003, ix*). For Rand—a disciple of IBM's good design movement—good design is a corporate design outcome's intrinsic quality imbued with the creative inspiration of an individual with God-given talent (15). However, though business-centered and aligned with IBM's design goals, Rand's mantra differs from its precursor in its inclusion of human values—a consideration underscored in Glaser's focus on citizenship. Glaser's mantra implies that the designer plays an important role in effecting good design through high moral and ethical values married to an awareness and concern for social impact. Whereas the original

mantra—Watson's mantra—empowers businesses and transcends social concerns, the latest one by Glaser, engenders the individual designer with power and agency to control and effect good design that is socially responsible—a theme still prevalent in contemporary communication design discourse. Consider the recent publication of the 2009 book titled *Do Good Design* by David Berman. The reason social responsibility is still a key phrase may be because the world is still in need of repair. Design is still both a source of remedies and, unfortunately, as Berman notes, a source for "the most destructive tools of deception" (2). For this reason, good design can no longer solely be based upon formal metrics. Knowledge of how to use white space effectively and a keen ability to apply that knowledge do not make an outcome good

FIG 1.

List of metrics for evaluating communication design outcomes

Does the communication design outcome establish credibility with its user?

1 The text uses supporting images effectively.

2 There is a unified appearance of all images in composition.

3 The information is visually organized and coherent (e.g.,unified appearance and sequencing).

4 Information is aligned and organized effectively according to an underlying grid.

5 Aesthetic treatment of design layout stimulates and facilitates use cross-culturally.

6 There are no decorative-only images or aesthetics.

7 The design outcome exhibits a high level of creativity or innovation.

8 Images are produced and presented professionally in high-resolution (print: 300 dpi color, 150 dpi greyscale; screen: 72 dpi).

9 Only 1 to 2 fonts are used.

10 Column widths are appropriate.

11 Appropriate selection of font. Point size(s), kerning, tracking, leading support readability/legibility.

12 Design outcome is accessible to targeted senses (e.g., legible, audible, etc).

13 Information is sufficient in quantity and accurate.

When the designer authors the information, evaluate writing performance summatively with the metrics below. In the formative evaluation process, the student may consult with a copy-editor and proofreader to satisfy the following metrics:

1 Argument of authored text is thoughtful and expressed within a theoretical framework.

2 Authored text reflects great depth of knowledge (i.e., it includes high quality observations, analyses, description and reflection).

3 No errors in punctuation, spelling or grammar.

4 No errors in word usage, subject/verb agreement or sentence structure.

5 When appropriate, references to key literature (e.g., evidence-based research) are present and in correct format.

6 Authored text demonstrates logical sequencing of ideas through well-developed paragraphs; transitions are used to enhance organization.

7 Authored text is well written, concise, clear and stays on topic.

design. In the specific case of the university's website, using white space to create hierarchy coupled with eye-catching motion graphics was not enough to attain goodness. Even mere consideration of human and environmental values alone does not equate to goodness. Certainly, as CONTRIBUTOR 1 notes, accessibility matters. However, CONTRIBUTOR 5 is also correct that more standards are present and need to be 'spoken' or disclosed in the evaluation of the website. The discipline of communication design has many tacit standards that if unearthed, compiled and integrated in the evaluation process may lead at least to more persuasive arguments with others outside the discipline about the value of form; and, at most when used pervasively they may inspire design outcomes that actually *solve* social problems.

Does the communication design outcome stimulate and facilitate ease of use in a public context?

1. The design outcome has a user-friendly interface that facilitates and stimulates use.
2. The proposed context of use is viable and accessible by the targeted user.
3. The design outcome incorporates appropriate materials for context of use.

Does the communication design outcome resonate with the culture(s) of users?

1. The design outcome uses culturally-appropriate aesthetics that respect and acknowledges the user's gender, age, impairment, literacies, etc.
2. The design outcome communicates in a way that resonates with the culture(s) of its users.
3. The design outcome displays a clear ethical sensibility that shows respect for the user, the designer and society at large.

Does the communication design outcome improve humanity and/or the envlronment?

1. The design outcome shows a potential to make a positive social impact (student design only).
2. The design outcome makes a positive social change with a measure that shows statistical significance (professional design only).
3. The design outcome uses eco-friendly materials (e.g., materials that are energy efficient).
4. The design outcome is sustainable.
5. The design outcome can be adapted for other uses or recycled, if it follows "cradle-to-cradle" (McDonough and Braunga, 2002) lifecycle rather than cradle-to-grave.

FIG 2.

The steps to social change: A re-grouping of criteria (with presumed metrics) from low to high with social change being the highest step to climb.

TOWARDS ACCOUNTABILITY FOR SOCIAL CHANGE IN COMMUNICATION DESIGN

My recent work (*Bennett, 2011*) argues for a set of metrics, updated and reproduced in FIGURE 1, for evaluating student work and professional exemplars of communication design. The columns of text shows the list of metrics that I use to determine whether or not the communication design outcome meets five different overarching criteria for good design.

By providing students with these metrics at the beginning of the term or prior to the start of a project, they can use them to guide their design and creative decision-making processes. Thus, students use the metrics as a formative evaluation method in their own iterative design processes. However, when I use them at the end of the student's design process to evaluate their outcomes, they serve as a summative evaluation method that enables us to see which metrics they've mastered and which need improvement. When they receive this type of evaluation across several projects and even classes, performance patterns emerge that reveal strengths and weaknesses in their overall design skills and knowledge.

More importantly, however, the metrics serve as a guide to students for the kind of design work that yields a good design evaluation. As depicted in FIGURE 2, attaining good design is like climbing a steep set of steps; the closer their design outcome approaches social change the better its evaluation. While in school, students are expected to master a set of skills that will prepare them to enter professional practice after graduation. They are not required to change the world. They lack the time and resources to solve real world social problems. Thus, they are only evaluated on the observable potential of their design outcomes to effect social

change. However, professional design outcomes, like the university's webpage, are held to a higher standard with the metrics in FIGURE 1: they are required to effect or to have effected positive social change. Good design should require good social change. We should evaluate design outcomes on their positive or negative impact on society instead of only their imagined potential to bring about social change or their formal aspects; and, if it we do this collectively on a global scale then we might transition from the present age of social consciousness into a future age of accountability and benefit from the fruits of our labor through a synthesis of our social consciousness and research-driven design advocacy.

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ATTENTION TO DYNAMIC CHANGE & INTERCONNECTEDNESS

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Thomas OCKERSE

LEARN FROM THE CORE DESIGN FROM THE CORE

ABSTRACT

The current objective, object-oriented approach to design is questioned along with design education viewed as a job-oriented endeavor. Instead relational knowledge and experience in a holistic sense, both tacit and explicit, are valued along with an appreciation of the unique character of the student. A new paradigm for design education is proposed that embraces collaboration and focuses on integration of study, experience and reflection that translates beyond design into an intelligent life.

"I call for more attention to seek a right balance between 'study,' 'experience' and 'reflection'...as a way to understand more fully the dynamic systems of underlying principles at work...Again, this integrated perspective is at the heart of contemplative design."

EDUCATOR AND ACTIVIST, Parker Palmer claims:

> *We are being called upon into a more paradoxical wholeness of knowing by many voices. There is a new community of scholars in a variety of fields now who understand that genuine knowing comes out of a healthy dance between the objective and the subjective, between the analytic and the integrative, between the experimental and what I would call the receptive.*[1]

In the same book, co-author Arthur Zajonc adds:

> *The curricula offered by our institutions of higher education have largely neglected this central, if profoundly difficult task of learning to love, which is also the task of learning to live in true peace and harmony with others and with nature.*

These statements reflect the paradigm shift from the mechanistic Cartesian worldview (the world as a collection of objects) to a holistic, ecological view of reality as a shift in consciousness from objects to relationships. In this new perception of reality the properties of parts are not intrinsic properties, but can only be understood as merely a pattern in an inseparable, integrative and dynamic web of relationships. Realizing this shift is central to all our perceptions, and therefore to our future of design as a field of practice, and most significantly, central to design education.

For education, this means nothing less than a call for total transformation: to establish an emancipating environment that facilitates a process that awakens the capacities of the whole person for all participants in that community: students, faculty and staff. As Wendell Berry declared in 1987:

> *The thing being made in a university is humanity ... (as) responsible heirs and members of human culture.*[2]

This transformation requires attention to what the Dalai Lama calls "the secular ethics of the heart". . . . the stuff most educators tend to dismiss as being outside the territory of the course subject, while faculty declare that this is "not our business."

Education and design are now at this very threshold of change. They thrive on their interdependence, just as they have throughout their evolutions. I envision the respective fields to change significantly in the future—as they must if either is worth its salt regarding its contributions to the world and humanity's stewardship to its planet called home.

In 2003 the ICOGRADA education team was asked to respond to the question: What can education offer that will truly sustain students in life? As an invited contributor my response was, in a nutshell: students need a process that helps them cultivate their intelligence to become truly integrated individuals capable of dealing with life as a whole — as human beings foremost — and only then as designers. I view this nurturing of intelligence as the central task for educators, their primary purpose. That we happen to do this via design is useful, but secondary. For education this is at the heart of the word sustainability. For what ultimately sustains us only comes from our inner capacities that arise from the core or our heart of being—not from some external source or authority.

Contemporary western education, with its tradition so firmly established since Aristotle, is a system based on comparison and competition. Its main interest is to multiply knowledge and facts and to develop intellectual skills and clever minds. That system perpetuates materialism and fragmentation as the way to view the world, which only proliferates the current state of our world. Clearly then, that system has missed the point because it has not helped bring about the understanding of the total process of consciousness.

> *Caught up in explanations education fails to nurture intelligence. Intelligence reflects an understanding of the total being, the total process of human existence.*[3]

And only when the mind and heart are integrated in action does intelligence have a chance to enter into life.

In a recent interview with Hugh Dubberly (a former student of mine in the late '70s) by Melcher Media,[4] Hugh makes the observation that design practice is stuck, trapped in the past, unable to move forward, unclear on what forward might mean, lacking the mechanisms to build and share knowledge, and lacking even a model of design knowledge. He illustrates this with two speakers who spoke at a 1985 conference, Nicholas Negroponte (architect and technologist at MIT) and Milton Glaser (graphic designer from New York), and again twenty years later at a similar conference (AIGA). In this second meeting Dubberly notices how much had changed in Negroponte's professional life, while little had changed in Glaser's, even though both have lived in the same relational context of vast changes in computer technology and the Internet.

Interestingly enough, some of that is expressed in the field itself by the apparent "democratizing" of the practice and the proliferation of "expertise" under new labels (albeit reminiscent of the emperor's new clothes), such as: Information Architecture, Experience Design, Interface Design, Interaction Design, Interactive Design, Universal Design, Service Design, Ethnographic Design, Human-centered Design, User-centered Design; along with new jargon such as persona, stakeholders, usability, scenario, human factors, heuristic evaluation, design thinking, action-centric design, etc. In my opinion, none of these change what it means to design from its core perspective of meaning (as "right action" to network relational order for the purposes served), but appear on the surface as different, supporting separation. Again, the names and jargon set up illusory identities that merely perpetuate the objective worldview, but veils the essence of meaning.

Increasingly it appears that design cannot remain as limited, specialized knowledge and skills, but reflects more a process of a gathered, collective effort of expertise—or more precisely, intelligence. Interestingly enough, technology has facilitated this kind of "democratizing" of design, with more and more people participating from different fields that were either needed or

found their way in by coincidence. (By "democratizing," I do not mean to give equal license to the non-skilled to perform specialized skills identified with experts, for example, in visual form giving, aesthetics, visual problem solving.) I mean to reflect collaboration and integration of the variety of input needed for a particular situation (expert or not). We know this is already happening. Those more prepared in intellectually-centered academia have contributed their knowledge from fields like cognitive science, computer science, engineering, biology, cultural anthropology, behavioral psychology, linguistics, philosophy, marketing—you name it. While "theory" (i.e., the abstraction of ideas relative to causal and contextual phenomena) remains relatively undeveloped in the design field (i.e., in comparison to other fields, especially the sciences), the practitioners in other disciplines have helped articulate the theoretical perspectives, in their own terms, for the field of design, thus stimulating and expanding our design awareness for relational factors.

Of course, this has created some confusion as the identity of design is diffused. For example, because of today's technological emphasis, the relational phenomenon often directly reflects the design of electronic devises as a distinctive endeavor labeled as Experience Design and Interaction Design. However, "experience" and "interaction" are fundamental issues to all design products that serve human needs—from tickets to books, doorknobs, cell phones, buildings like museums, urban spaces, as well as social and informational forms of networking. In that same sense we cannot limit the term Interface Design to computing screens since all design products, from posters to phones to museums, serve as the means or "interface" to address some need or function. We are a species that not only relies too much on the need to label everything in order to "know it," but then also rely too much on the "collapsed meaning" of such labels as the gospel truth of its nature. (By "collapsed meaning," visualize a concept map with the word in the center and many other words around it—the collapse of the "many" into one, gives meaning to that center. But remove the surrounding relational elements the meaning is open to conjecture, i.e., we "think we know the idea.") Labels have practical functions, of course, but meaning, as we learn sooner or later, is forever dynamic (not fixed or frozen) and merely a construction of thought that operates in an unlimited

space of dynamic relationships (therefore, at best, rendering the "object" temporarily as such)!

Furthermore, we cannot view the relational aspects involved merely in their simplistic format of object to client or user. For example, traditionally design has existed mostly in the overlap of business and art. Today we see an expanding relational view of interconnectivity with other fields: computer science, engineering, technology and the physical sciences (light, computing), cultural anthropology, behavioral psychology, ecology and other natural sciences, social sciences and politics, critical theory, philosophy and ethics, and we could even add metaphysics, or whatever relational value a field can possibly bring to help designers understand how to better address human needs, interests and values.

Design viewed from this multi-relational perspective becomes an opportunity to consider many related interests and skills for participation as collaborators! Consequently we can expect that more and more people can participate in this activity, contribute to the field, and also enable designers to make some of its tacit aspects become more understood from an explicit perspective. This collaboration provides a very powerful way of looking at our design future. Of course, the reciprocal also happens with other fields of expertise contributing to design. For example, in more recent times computer programmers have embraced Christopher Alexander's architectural theories on "Pattern Language"[5] as a way to help them understand computer science.

However, this phenomenon also tends to bring about anxiety. Practicing designers get anxious when technology options seem to threaten their known ways of practice, and the younger generation appears to pass them by with knowledge and skills with which the older generation can't keep up. In education, students tend to focus on their immediate future and readiness to be employed, not with what they might be doing in a changing world some ten to fifteen years later. Educators with anxieties about the rapidly evolving technologies effecting how information exchange can function tend to focus on training and facts, thus loosing sight of their essential responsibility to help draw out the student's intelligence, to nurture their capacities and to provide enduring knowledge and meaning.

The anxieties mostly reflect our own personal insecurities with change, our inabilities to let go of our projection of expectations,

our sense of inadequacy when others (especially academics) can spout the jargon more prolifically than those who use few words but create, and our continual focus on the appearance of material things rather than the invisible underlying principles. Teachers need to embrace these developments as an integral part of the ongoing process of human transformation. (As a designer and as an educator, I have delved into studies of semiotics and systems science to help me understand how to use the visual language of form beyond aesthetic values, and how to define the patterning of parts within the whole when giving visual form to information.)

This broader and deeper understanding of design reflects the relational aspects we come to see. When the mind is "on" the notion of complexity, it gets entangled, bound up and overwhelmed. When the mind is "in" complexity we can "know" and trust it, work through it, yet without being able to articulate it in words. Simplicity and complexity are not polar opposites, they are relations based on our perspective. Such awareness stimulates the vision to collaborate, to de-centralize knowledge and skills and to work in terms of a more integrative paradigm that speaks from the core of our intelligence and humanity. In turn designers strengthen the value of design and its significance to go well beyond the perception of design as surface treatment. This new paradigm embraces "life experience" as master teacher in living the life of knowledge in a world of constant and dynamic change.

Experience is significant. Not only does it help us correlate what we have "studied," but it actively and immediately synthesizes and mediates our perceptions of and engagement with the external world with that deep sense of internal knowing from which ethics, truth and wisdom arise. Once we recognize, understand and appreciate this relational complexity and address the need for interactivity, those who prefer to operate closer to the center as a "designer" should also understand where to position themselves in relation to the other fields of expertise. In other words, the way we make use of this knowledge from within provides the key to its real value in what is expressed as design action and thinking.

While the "pouring in" of knowledge (the western Aristotelian approach) remains prevalent to education in general, art and design schools take exception to that by offering students a learning process mostly gained from direct experiences in their creative dialogues with what they make. This sensory-mindful engagement stimulates

sensitivity and insight, and truly draws out from within. An internal-external dialogue brings explicit and tacit awareness into a meaningful relationship. In this process of experience we integrate our total ontological nature with feeling, thinking and action: to navigate consciously and even unconsciously our immediate sense of relationship to the external along with our deepest and most profound sense of awareness and knowing (Plato's "integrative" approach that draws out from within).

In my opinion we must learn to not preoccupy ourselves with the mind "on" objects (i.e., projecting, labeling, categorizing), but allow the mind to be open and "in" the objects to experience and "in" the actions of engagement. I call this the "contemplative practice of design." Doing so allows the tacit (which the rational mind cannot easily explain) to have a chance to emerge and become meaningful. When we come to nurturing creativity, academics and study alone stifle it! Experience plays a major role in this perspective since creativity can only come from the unknown, never from the known. Similarly Tim Brown, CEO of IDEO, recently said

> *design is always a mix of disaster and opportunity*[6]

meaning that we work within the context of the system as we know it, while at the same time must keep an open mind and question it.

So "doing" and "being" are the two sides of the same coin. But, how often do we really ask ourselves what it means to simply "BE"? For example, the term "Human-centered Design," one of today's buzzwords, I like because it reflects a noble and justified principle that integrates the epistemology with ontology. But, do we really know what it means to be "human"? Of course, our whole human nature is an extremely complex system that remains largely still a mystery in spite of what science claims.

We each know our self and the universe around us through the perspective of our self. Each of us is the center of knowing, the knower. Knowledge results from a movement of consciousness going outward and inward, although this mostly reflects external relationships with objects and ideas of other people as an objectifying process. In this process we pay less attention to our inner nature, not observing what actually goes on within ourselves as a mediator and processor of consciousness. We particularly miss the tacit and immeasurable in our nature.

There is something more than our direct attention—we might call this phenomenon a peripheral view that can apply to all that triggers our consciousness in the process of awareness when we pay attention. This is why designers need to pay attention to the multiplicity of "centers" as parts seen in relation. When we become aware of these relational connections patterns emerge that reflect meaning from one depth to another. When we change one part we affect all relationships—exemplified by the butterfly effect Buddhist philosophy uses and the new science.

Now that we have traveled briefly in the larger picture of our nature of being, how does this reflect the nature of design? The task of being conscious of the many in this holistic relational web challenges us, although actually it's so very simple: pay attention. Attention stimulates peripheral awareness as well as specifics. By default this reflects the nature of multi-centeredness; not limiting our perspectives to the specifics in isolation (as labels!). This shows the need to be open to perceive the dynamics of relational patterns active in an open network of relationships; such awareness enables us to allow our interest to perceive the relational contexts, while it simultaneously forces us to keep an open-mind and act responsibly toward the whole of attributing factors to help bring about meaning.

I strongly advocate theory, or "study" in the arts, but work hard to balance this with the process of creative production/action or "making." However, a third component equally essential (but least attended to) is reflective practice. Reflection offers the assimilation and right appreciation of what the other two offer. Depth of meaning can only occur when these three dimensions of learning overlap. They remain unique methods, but cannot be used alone. To bring about their synthesis requires balance in their use. We tend to emphasize the left-brain activity, which promotes living with our minds "on" objects and projecting what we would like something to be. In that limited use of mainly the left-brain we limit awareness and the true capacity to unfold, discover and see anew. I call for more attention to seek a right balance between "study," "experience" and "reflection" (primarily a right brain function) as a way to understand more fully the dynamic systems of underlying principles at work, especially for design practice. Again, this integrated perspective is at the heart of contemplative design.

The exploration of the nature of the explicit and the tacit always plays an important role in the creative efforts to which design holds the keys. Without it the results would never reach new heights. As William Butler Yeats said,

> *Education is not the filling of a pail, but the lighting of a fire!*

Furthermore, as education is merely one experience for that, the full responsibility for personal development and how to apply what was learned, rest ultimately on the capacities and choices of the individual—as part of one's internal development of consciousness.

Having lived through an evolving process as educator, theorist and practitioner of design, I now feel an urgency to emphasize the balance of the aspects of study, making and reflection, and the need to provide an educational environment that considers the student first. Educators must not impose on students a projected program requirement of knowledge and skills but provide a flexible program that nurtures ethics, enduring values and develops integrative skills and perspectives, while addressing the individual's interest with empathy and attention. In other words, an education that seeks to help draw out from within the inner capacities of the individual is the focus.

At the core of this reality is what we call "life" as the dynamic force of nature expressed from within and throughout our nature of being. We must understand this underlying holistic principle as the core of integrative being, thought and action, similarly design, in education and practice, especially with our increased reliance on digital media and in a world charged by the dynamics of change that affect the personal and social environments for human interaction needs integration. Designers with visual art expertise, as they try to frantically keep up with this dynamic evolution and intellectualizing mode, should not loose sight of their particular expertise as visual form givers and their cognitive approach to design.

Most importantly, all must attend and nurture their interests and inner faculties and work where they feel inspired. They should not feel obliged to develop expertise they don't have or want; leave that to those with whom they collaborate. Only when the mind and attention are "in" the process as the experience, the contemplative approach, can designers (as collaborators) have the potential to become real instruments of value for creative insight

to define emerging patterns of relationships for which design serves its purpose. This human experience involves attention and heart—because only when we attend with heart are we able to open ourselves up to the web of relationships active in this process of engagement and cope with the very notion of complexity. We could say that this awareness reflects having a peripheral view, not just in the quality of perception, but in the principle it holds: to accept and not dismiss that which appears to be marginalized or even invisible; considering these aspects as in union with the center of focus.

In becoming tuned into the holistic nature of the human experience, we find ourselves becoming truly informed to help others. As Parker Palmer said in *The Courage to Teach*:

> *Many programs are trying to effect educational reform from the outside in, but the greatest immediate power we have is reform from the inside out. Ultimately, human wholeness does not come from changes in our institutions, it comes from the reformation of our hearts.*[7]

From this process "sustainability" (another buzzword) takes on quite a different perspective, not just for environmental matters, but reflective of individuals. We need to nurture who we are, not what others think we should be.

For that matter I have worked toward a practice of design in depth, breadth and multi-centered awareness, which I have come to identify as "designing from the core"—the core reflecting one's inner nature. From that core, design is merely a process that expresses itself in many ways for making and forming, for opening and understanding, for interpreting and expressing, and for the relational weaving of experiences, interests, needs and actions.

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Chris MYERS

HANDSOMELY, HANDSOMELY NOW! 5 IMPROMPTUS FOR THE EARLY PART OF THE CENTURY

For Robert Ackerman

ABSTRACT

Based on a 19th century compositional trope popularized by Frédéric Chopin, the impromptus presented here are linked as a storytelling suite. The notion within the impromptu is to seek depth through lightness, as if improvised. The five stories provide metaphors for the conundrum of design education and practice. They engage the reader in interpretation; an open-ended hermeneutic pursuit.

"The idea of the design intervention in all of its lights and shadows promises change, if not betterment. It is not ambivalent. It is never ambivalent."

I

> *Let me say, at the risk of seeming ridiculous, that the true revolutionary is guided by great feelings of love.*
>
> Ernesto Guevara, "CHE"

A few years ago, my wife received a tee shirt with his face on it as a Christmas giveaway at the local Army-Navy store. The dark, olive green of the fabric projects a vague, military fragrance and the red star recalls The Revolution, something now hazy, powerful and possibly nostalgic. Maybe for some this image still calls forth hope; maybe it is only hopelessness. For some, maybe it is only a Star. Che communicates to us through time, weightless, without age or a single layer of dust. His portrait is famously reduced to stark black forms—absolute—with no modulation. He is distilled and in his distillation his beauty is strangely magnified. Set in that handsome face are the eyes that only look down from the mountaintop or up into the clouds. His comrades called it "The Look". It was impossible to know what he saw. These are the eyes that only see the Future. These are the eyes that Michelangelo gave to Moses.

Trained as a doctor and with a desire to be a teacher, the healer sought out and took lives and shed blood. We have testimony to what he did and to what he witnessed. Caught in history's complicated web, his choices were limited. If he did no harm, could he have done anything at all? In his feverish writings, we have no understanding of how those images settled into his memory.

After Fulgencio Batista flew from Havana, the revolutionary was made Cuba's Minister of Industries and the President of its National Bank. These are the quotidian activities of the winners. This was the unimagined life. On weekends, he took up the machete and went into the fields to cut sugar cane.

A machete has its own beautiful, violent efficiency and exhilaration. It is the blade of the young. As a young boy, it was my job to take up the machete to clear paths through the North Woods where I lived. A man-child with a blade half his height can cut with remarkable ruthlessness and efficiency through the trunks of saplings. I have felt the exhilaration of this knife. The trick is in the angle of attack, the design of the stroke. There is electricity in its violence. Was Violence always part of this revolutionary's dream?

Che gave form to ineffable feelings: the pulsing, unshaped desires for Change, the passions for the ephemeral, unstructured design called Utopia. Was he the One Who Speaks for Those Who Cannot Speak Well for Themself? Are his great feelings of love reserved for the abstraction of a new world that is always beyond reach? In the revolutionary heart, is there any difference between a love and a passion?

He left his bureaucratic tribulations in Cuba to search for the Revolution in an unforgiving, mountainous land and in whose junta he found a target for his passions. It was in a land where the People seemed uncertain as to whether they wanted his visions. He died there, not for a cause, but as a trophy—a legendary animal, captured, cornered and shot at close-quarters within a schoolhouse. And so the would-be teacher dies within a classroom in a world where he never found his students. Some say that he was searching for his death that could only be meaningful in a place offering a rock for a pillow to remind him that he was alive.

The official photograph of his death resurrects him as it floats on each new wave of how we communicate with each other. It is awash in the sea of global communication. He is stripped to the waist, his wounds obvious. His last shoes were shattered ideas of a shoe, canvas fragments barely held together. They are not in the final image. Christ was barefoot.

Was the shadow of Rembrandt that breathes through this image a conscious construction of the photographer? There is the mystery of the violent deaths of each of the military men that

surround this deposition. In the official photograph, there is a nun who smiles—and who apologizes every day since for the betrayal of feelings that the camera seems to have captured. No woman before in the pictorial history of the Deposition has ever smiled.

His face is what carries him forward more than his deeds. For two thousand years, men have walked their own dark halls reaching out for another Messiah in their own flickering torchlight. He looks like the Christ that they expected. Today, Ernesto Guevara is canonized in the country of his death by the religious poor searching to define their own Gethsemanes.

What if he had lived? Can there be any solace for a lion in winter? For such as these, there might be little magic in the day-to-day. Can they see the present clearly, much less enjoy it, as compared to the Past? And can it ever hold the allure of the Future? The great love was always the love of the idea, not the great feelings for life and what it might hold. It is a pure love of the abstraction of a purified life.

There is a sense that the world has moved beyond his dreamed Revolution—the Revolution he knew would catch fire. Hoped would catch fire? Begged would catch fire. There is a sense that the Solitary Man with Heart Affire is now unnecessary, misguided or redefined. Does the martyr ever know his destiny until the trigger is released?

Nowadays, revolutionaries are discovered and forgotten everyday in an ethereal world of global communication and the attention deficit of its consumers. The designs of the hidden revolutionaries, the nameless ones, continue underneath our surveillance. They hover above those who live in the technological deserts of the world. All are reduced to technological shouts and whispers. Their grand designs become smaller. Now, we associate these men with the technology that delivers them to us or the technology they manipulate, a tweeted call to arms, *if* they flash across our screen of vision. So, too, the revolutionary designer of an inexpensive computer for Third World children, or the breathtaking inventor of titanium sheathing that appears to give a building wings. We remember the detritus of their deeds; we struggle to remember *them*. It is a bloodless coup. They are led to a quiet death as their innovation or their cry is absorbed into the every day and disappears, sinking into the instantaneous chatter of satellites. They shrink to our size and they fill our worn-out shoes.

II

> *As if we were the wind...* [1]
>
> Eleanore Marie Sarton, MAY SARTON, POET, NOVELIST, MEMOIRIST

Twentieth-century man preferred his mysteries to be kept between the covers of a book. Not so, his ancestors. In them, there was a desire to know, but a healthy acceptance of the unknown. What connects us to the Past is our continual fascination and respect for wind, which embodies the Gemini qualities of the early centuries' mystery and the twentieth century's need to redefine mystery as a problem to be solved.[2] No one can have more than ambivalence toward the caprice that is wind.

At an earlier age, I could gauge the temperature and temperament of the day by the pitch and the volume of the cedar-tree-filtered wind outside the window of my room. My room was a converted coal bin and more like a monk's cell, but it was my own and that was significant. In that simply furnished room without the distractions of radio or television, or any sort of media beyond borrowed books, senses were heightened. If I stood on a chair to look out of the window, I might happen to see a gull and the subtle ways in which the bird rode the wind would confirm my suspicions. I now live in the city and this talent is too often set aside.

No one knows who first decided to harness the wind, but it had to come from close observation of the personality of each breath and from cataloguing its behaviors. This is the design of the unseen. Our inventiveness springs from the senses. The body verifies. It validates. It tells us what is necessary. We do not know how we move to invention from sensation—the feel of the wind through the sailor's hair, the temperature of the air against his skin, the direction and velocity felt as an invisible hand pushing against him as he moves about the deck, the mist on his face. His observations of the dark patches of water might reveal the secret locations of small, unpredictable winds. There are the subtle, observed ways in which a gull plays the air currents.

A handsome vantage point in the history of man's negotiation with the elements is the early nineteenth-century English fighting ship. The intricate design of this vessel arose from the calculation of the force of the water on the bows, the tension on the rigging, the strain on the spars and the masts, the pressure of the sails, the

stress on the timbers of the hull. This ship is a living fabric, held in place by lashings, nails, joints, all manner of the carpenter's imagination, and the tension and release of each part to another. The crew is held in place by the lash and the noose.

The successful design must breathe; there must be a flexibility of the ensemble of parts to confront the emphatic shouts and the careless whispers of Nature. Every successful motion is a careful conversation between the ship, the wind and ultimately, the captain and his men. It is a heady, fragile concoction of ingenuity and the marvelous. This is the inanimate alive. It is no wonder that a ship is anthropomorphized. As the sails fill, *It* becomes *She*.

Granting that design is rife in the lines of the ship and its blueprint, the real design is the movement toward the destination. That is the province of men. It is a collaborative design that, given the intricacies of the machine, is also a design co-created by the captain, his officers and his crew. The majority of the crew arrives through the press, the forced deployment of the citizenry of England. They are the baker, the potter, the tailor, the farmhand, the petty thief, the gaoled and the drunk, all swept from their lives to the ship. They are old men. They are boys of ten years and all in between. The officers are drawn from the ranks of the seasoned seamen and the ranks of titled privilege. Some are the boys of privilege, given authority by birthright over men more than twice their age. The ship that sails from harbor to begin a commission is a fierce hash of sublime knowledge and gross ignorance. The most important aspect of the design of the fighting frigate is the education of the crew.

Here, design focuses on behaviors. This is not new. Design appears to arise from necessity, which is a gentler description of coercion. The idea of the design intervention in all of its lights and shadows promises change, if not betterment. It is not ambivalent. It is never ambivalent.

Learning is experiential, knowing by doing; a boy must climb a mast in a gale higher than the roof of his parish church. It is learning by repetition—the undervalued but powerful orphan of today's educators. It is based in listening. Inattention has public consequences. Practice precedes professional focus, the kind of focus that allows you to carry out your charge while under fire. A hierarchy is established; collaboration is essential. It is the merging of talents and the emergence of new talents. Sailors

learn in context—the changing weather, the circumstances of battle, the mercies and cruelties of the wind. If necessary, they must be able to repurpose, in all manner, the ship and its contents. They are caught between the water and the sky and at the mercy of their own invention. There will always be a plan. There will always be the destruction of the plan. In the end, creativity will be the hinge on which the life of the community may turn. It is the spark to all of that practice and all of that focus. It is either present or absent. There remains the impossibility of teaching creativity, or parsing successful collaborations.

The English Navy, like all armed forces, depended upon the irrationality of man. Though impressed into the service for at least a two-year conscription, many of these men willingly died for a king that they may not have particularly admired. They died for the idea of a King and for the abstraction of England, an English Utopia they sorely missed at sea and one that did not exist. The Articles of War,[3] the official contract under which the sailors were conscripted, is saturated with the threat of the lash and death. It was read aboard ship every Sunday after church service because many of the crew were illiterate. It is well recorded that floggings and sometimes, the noose, were useful at the beginning of a voyage; they were much less in force in a successful, fighting commission. In the sailor's heart, is there any difference between love, duty and loyalty?

It is not without suffering; it was unimaginably hard until you become inured to it. Old men will die. Boys will die. And all in between.

How adaptable one can be when the options fade with the shoreline! Is adaptability our inherent design? At night, the safety and progress of the ship is guided by the senses beyond the memory of the sea charts and the glance at the compass. The tilt of the deck. Listening, the sound of the canvas, the songs of the rigging, the live cries of the wood, the percussion of the water and the bows.

Sometimes it appears that we are sailors moving through a gale at night with the wind flowing against our ship and through it—flying before a gale as if we were the wind. How we come to invention is both a mystery and a problem. How we attempt to teach creativity is both a mystery and a problem. Eventually, isn't the success of education located at that point where your knowledge

lies so close to the heart that it is more felt more than known, accepted without being seen?

III

> *Are these triangles supposed to be mountains? Do all designers believe this, or just the ones that you work with? They just look like triangles to me.*
>
> David Seneca Myers, MY SON AS A MIDDLE SCHOOL STUDENT

Who are we talking to?
Who are we working for?
Who do we *want* to talk to?
Who *could* we help?
Who should we be talking to?
Are we *talking* when we should be *listening*?

Are we helping?

IV

> *Our own epoch is determining, day-by-day, it's own style. Our eyes, unhappily, are unable yet to discern it.*
>
> Charles-Édouard Jeanneret-Gris, LE CORBUSIER OR "CORBU"

The lasting memory is the glasses, at first perfectly round, later in life slightly modified, but always, heavy, black frames that overwhelm the birdlike features: the beak of a nose, the swept-back hair like avian plumage. He writes in sound bytes before they existed with a self-assurance found also in Walt Whitman: "I *will* be read!" Today, there is also a sense that his texts, despite their assured propulsion, are more like instruction manuals to be declaimed in vast, empty, echoing auditoria—he is talking to himself. When he refers to 'our' in his writings, the word appears to include himself with his audience as Everyman, but the aftertaste washes over with an implied *j'accuse*. A pejorative *you, you people, you* can never be *me*. He saw architecture and design in crisis in the early part of the twentieth century and nothing less than the clear sand at the water's edge after the receding wave would suffice as his beginning point to save it. He ran from history as if he were chased by wildfire.

Today, it cannot be said that design is in crisis, if it ever was. The design critic Lorraine Wild notes that

> *A successful search for either aesthetic absolutes or social reform are symptomatic of the alienation of those who want to avoid the complexity of both the past and the present.*[4]

Maybe so. Or maybe they had eyes that only looked down from the mountaintop or up into the clouds.

Design is most often reactive: a deluge, a flood, a dam, a levee. Necessity appears to supply the quick match for the powder keg of ingenuity. Now we live in a state of 'churn,' a state-of-mind offered up by David Thorburn,[5] to describe the uncomfortable time in which technological advance, and very importantly, its resultant technological displacement or submergence, rains down into industry and daily life as one honored technology or a treasured behavior is retired in the face of a new one. Churn roils the waters. It engenders doubt, feeds the dread feelings of unpreparedness, magnifies the worries that one is out-dated—about to be cast aside. Fundamental change is uneasy; it engenders self-pity. Thorburn suggests that technological advancement, particularly in telecommunications, has been so rapid and so insistent that there are no longer the fallow periods where life settles into its newer frame. Life no longer offers the quieter progression gracing the transition from sail to steam, the horse to the automobile. Churn and its discomfort is now the toll on the road to Utopia or maybe just a hazy Future.

Design that fuels desires rather than needs continues unabated. We do not know if it was bequeathed to us genetically from out of the depth of Lascaux's dark faith and deep mystery. A new armchair is not indicative of a crisis in seating. Karim Rashid's elegant *Garbo* wastebasket, found in countless mid-priced hotels across the land, does not herald a crisis in consumer waste disposal. It is beside the point. It exists, as does much of design—because it can.

A very real crisis in Design Education was detonated at the beginning of the 1984 spring semester at Drexel University in Philadelphia.[6] That year, the university required that all of its students have personal computers, in this particular case, the Macintosh. Ever since, Design Education has followed Technology like a retired hunting dog. There is the memory of the chase,

the exhilaration of leading the master. But today, do we fetch? Roll over? Or do that which every dog secretly wishes when his owner isn't looking? Break the leash and chase butterflies. Churn pressures the educators to both provide a path to today's practice as well as to ensure the student's ability to adapt to what happens tomorrow. The challenge is to design the unseen.

Corbusier suggests that we cannot see ourselves as we are or within the life that we live. He looked for order, called it "the style," and for him it floats above his forms to usher us to a new way of living. His geometry provides a handsome reflection of clarity, the white walls an attempt to banish shadows, to satisfy *his* desire for light. The mystery of light has become a problem or a solution. It flows in through the windows creating a private, exclusive Utopia. It is untouchable. Corbu gave form to ineffable feelings: the pulsing, unshaped desires for the New, the passions for the ephemeral design called Utopia. His Achilles heel was that of many of us: he assumed we might be like him or more likely, wanted to be. His is a pure love of the abstraction of a purified life.

We are still fighting our battles with mystery and we are still attempting to redefine our mysteries as problems. We are capsized continually because we have no defense as designers against the irrationality of Man. We have developed a desire for logic as an antidote to human nature, an impulse to fix or repair rather than understand. How is this different from Corbusier's Radiant City[7]? We are comfortable with need, less so with desire. Need asks for a ramp, a pulley. Desire can ask for everything. How many times are we ambushed by man's unpredictability? We breathe over this concoction with *our* good intentions, *our* hopes, *our* desires. We have developed a culture of not listening, where we write profusely, but read sparingly. At least, Corbu had an audience.

Who has seen the Future? Who has seen the wind? Very few, if any, have been allowed to cross Jordan to that Promised Land. Corbusier did live to see the Nazis repurpose his landmark Villa Savoye as a haystore. Perhaps they found his movable walls useful to their purpose. He did live to see his idea of cities ringed with wide highways and the celebration of the automobile. He did not live to see the traffic of Los Angeles. He lived to see his *Radiant City* transformed into urban housing projects in America and France to house the poor in isolation. He did not live to see their celebrated destruction. As a young man, he stated that,

> *The father no longer teaches his son the various secrets of his little trade.*[8]

If this were not so, he would have become a watch enameller, a dying trade in Switzerland as mechanization took command in the early twentieth century.

His concrete ideas for the future might be seen in the Indian city of Chandigarh. It was built by the Indian people with whom he did not wish to work. The images of the time show us young women in saris carrying cement in flat baskets balanced on their heads. The City of the Future is built as if it were the Pyramids. Handcrafted. He did not live to see it neglected. He did not live to see the footpaths of the people who had to live there worn through the perfect plans. He did not see the washing hung to dry on the prefabricated concrete lintels or the makeshift barber stands on the streets.

What will we be blamed for?

And yet, there is the gift of Notre Dame du Haut. I am thinking now of a photograph of my favorite teacher and a young woman walking up the rise at Ronchamp to that church years ago. He may have known Corbu. Their frozen gestures are within the light and slightly formal etiquette of a new friendship. He is at the end of his career; she is at the beginning. The church appears to rise, despite its heavy, ten-foot thick, concrete walls. It appears to rise as if the wind. Neither of them knows that I will marry this young woman. Who can see the Future?

V

> *Once more unto the breach, dear friends, once more...*
>
> William Shakespeare, HENRY V, ACT III

It is a matter of paying attention. Close attention. That design, which is so easily explained as a protocol or series of obvious, logical steps, is often more difficult when it must be executed in real world conditions: tide, wind, the tensions of the ropes, the necessary attentions of men.

Let us suppose that our fighting ship must be held to its anchor under conditions in which the ship's anchor will most likely be overwhelmed. If this occurs, the ship will be grounded, potentially

with loss of life, certainly with the loss of the ship itself. Here is a problem that requires the attention of science, imagination and faith. If a cannon that could fire 24-pound shot is attached to the cast anchor, the combined weight of the cannon and the anchor might sustain the ship through the night. The cannon must be released from its protective breechings on deck and swayed to a small boat alongside the ship, then rowed out to the anchor site and sunk. The theories of force, gravity and the physics of the pulley are at the mercy of the quality of communication and trust between the officer and his men. What is essential is the concerted carefulness of execution, because without it the damage is significant. The gun will plummet and breach the timbers of the launch with the loss of the gun, the loss of the launch, potentially with loss of life or the maiming of the boat crew. And the eventual loss of the ship itself, that would consecrate the failure. The action is designed and monitored closely. Collaboration reigns. Improvisation is at the ready hand.

The ship's crew sways the hoisted cannon and its carriage over the fragile launch, which, with the help of science can bear this extreme weight—inch-by-inch—intent on the necessary soft-landing, the only way to avoid sinking the small craft.

The Second Lieutenant calls out to his men, "Handsomely! Handsomely now!"

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As usual, these thoughts would not have come to print without the insights and challenges of others: Nancy R. Mayer, Ann de Forest, Sherry LeFevre, Dietmar Winkler, Hans Ulrich-Allemann and Robert Ackerman.

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1 *From: Sarton, May. 1992. May Sarton Collected Poems: 1930-1993. New York, NY: W.W. Norton and Company. May Sarton, (1912-1995) was an outspoken voice in American literature, perhaps best known for her journal meditations, especially Journal of a Solitude (1972-1973) Her recurring themes are those of Nature, everyday life and aloneness.*

2 *This succinct description of the transition from the early 19th century to Modernism is attributed to Gabriel Honoré Marcel (7 December 1889–8 October 1973), the French philosopher and playwright. Marcel is often mistakenly identified as the first existentialist. He himself did not accept Sartre* et alia *as philosophical companions, but rather saw*

himself as steeped in the Philosophy of Existence, an important distinction. I am grateful to Robert Ackerman, Fellow of Cambridge University, and author of J.G. Frazer: His Life and Work, (Cambridge University Press), who steered me toward this idea as I was preparing a course in 19th century cultural history. That was years ago and I have never forgotten it. It changed everything.

3 *The Articles of War are sketched out in the context of traditions, rules and expected behaviors here. Craig V. Fisher, Royal Navy & Marine Customs and Traditions, Ship's Company H.M.S. Richmond Royal Navy and Marines Living History - 1775 to 1783. (Accessed January 6, 2012, last modified August 27, 2004) http://www.hmsrichmond.org/avast/customs.htm*

4 *Wild, Lorraine. 1992. On Overcoming Modernism. I.D. Magazine (International Design Magazine), September-October, 74-77.*
What is interesting in reading this article twenty years past its publication is to note what it predicted. While it was controversial in its time and caused a certain amount of generational rift among the design cogniscenti, today it appears to be more observational than confrontational. There is also a vague undercurrent that we are too burdened, maybe too busy coping with everything (churn?), to dedicate our lives to the Revolution.

5 *David Thorburn, MacVicar Faculty Fellow at MIT, author of Democracy and New Media and Rethinking Media Change (both MIT Press), developed this description as part of the historical cycle of technological innovation and cultures' acclimatization of change.*

6 *Master, Joseph. 2011. When the Mac Came to Market Street; the story of the Drexel Microcomputing Program. Market Street, Fall-Winter. (Accessed January 6, 2012.) http://www.lebow.drexel.edu/Newsroom/Publications/MarketStreet/mac.php A further description of the Mackintosh debut can be found here.*

7 *A more complete description of the fate of Chandigahr and its genesis in the theoretical Radiant City is catalogued in the two fairly recently published books that follow.*
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8 *Petri Liukkonen. Le Corbusier 1887-1965. Books and Writers. (Accessed January 6, 2012, last modified 2008) http://www.kirjasto.sci.fi/lecorbu.htm*

Also germane to this piece is the following:
Turkle, Sherry. 2011. Alone Together; Why we expect more from technology and less from each other. New York, NY: Basic Books.

3

DIFFERENTIATION & RESEARCH IN GRADUATE DESIGN

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Meredith DAVIS

LEVERAGING GRADUATE EDUCATION FOR A MORE RELEVANT FUTURE

ABSTRACT

Arguing that the 21st century context for design is significantly different from the previous century, a set of structural suggestions are posed that can leverage change. Administrative arrangements are questioned along with the lack of clear differentiation or performance expectation among design degrees. While widespread, confusing and contradictory ideas about research complicate the situation, the leverage point is identified in graduate education.

"If we expect to meet the challenges of the contemporary context for design, we must study that context for what truly separates leadership and innovation from business as usual. We must anticipate new places where design can have influence."

A LEVERAGE POINT *is a place within a system where a small amount of change in force produces a great amount of favorable change in the output of the system. The most effective leverage point will be a shift in the paradigm on which the system is based, which determines its goals, rules, structure and general culture. So if we think of design education as a system and can agree that there is currently a mismatch between what the system produces and what the twenty-first century context demands, then our task is to look for a leverage point that will shift the mindset of the system and produce better results.*

THERE IS PLENTY OF EVIDENCE THAT TODAY'S CONTEXT FOR DESIGN PRACTICE IS SIGNIFICANTLY DIFFERENT FROM THAT OF THE PREVIOUS CENTURY. Problems are increasingly complex and the goal is not to simplify things, as we did under modernism, but to manage them. Complex problems require collaborative work by interdisciplinary teams. Design is no longer at the cosmetic end of a decision-making food chain but a necessary partner with a variety of disciplinary experts. Among those experts are users, who play an expanded role in the development of content and form; increasingly, we design *with* people rather than *for* them. And because people are now involved as co-creators, the designer's work shifts from crafting discrete physical artifacts to developing tools and systems through which others create their own experiences. Because this work responds to a rapidly accelerating technological evolution, the stopping point for design moves from being "almost perfect" to "good enough for now." And as a result, the relationships among people, objects and

settings constantly change, extending the demand for research that informs the next iteration of solutions.

These changes have altered how a young designer enters practice. In the twentieth century, design graduates began work in the technical service of more experienced designers. If they performed well, they advanced to form-making. And if they stayed in the field long enough, some earned the right to advise clients on overall communication or product development strategy. Today, there is too much to know about the management of technology to think of it as the steppingstone to some other aspect of design practice. Further, the democratization of the means of production and distribution through software and the Internet diminish the role of the designer as the gatekeeper to getting things made. And as design lost some of its traditional responsibilities in the last decades, it expanded its involvement in high-level business strategy, especially in the areas of innovation management, branding and service design. No longer do students enter a single definition of practice through a hierarchical sequence of responsibility.

These changes in the context for design practice are nothing short of transformational, but not well supported by a twentieth-century, craft-based model of design education that presumes a designer is occupied primarily with the issues of form and the mass production of identical objects. Yet that is precisely the paradigm on which most contemporary design education is based. Students begin their studies with abstraction—projects isolated from the rich contexts in which design problems reside and that provide frameworks for action and judging the success of design solutions. They advance through undergraduate curricula tightly defined by products (books, motion graphics, packaging, etc.); tools (Photoshop, InDesign, etc.); or segments of practice (corporate design, website design, advertising, etc.) Any or all of these products, tools or practices may change, even before students graduate, leaving little content that will endure across their careers in the field.

Waiting in the wings to capture the territory overlooked by design education are other disciplines, such as psychology, computer science, anthropology and management. Each is ready to provide scholarship and training in the absence of design research and curricular leadership on issues that shape the world of contemporary problems.

So if we want to change the system that governs what design graduates *know* and are *able to do*, where is the leverage point? Where do we institute a paradigm shift—especially in times of economic and regulatory crises—that will have positive effects for generations of designers to come?

I suggest that the leverage points for making design education more responsive to a changed context for professional practice and disciplinary scholarship are master's and doctoral programs, for the following reasons:

1 _____ **THE FUTURE DESIGN PROFESSORIATE WILL COME FROM GRADUATES OF MASTER'S AND DOCTORAL PROGRAMS, SO IN CHANGING THESE STUDENTS' PERCEPTIONS OF THE PRACTICE AND THE DISCIPLINE, WE SUBSEQUENTLY CHANGE THE CONTENT OF UNDERGRADUATE EDUCATION AS WELL.** The current generation of senior professors is retiring, leaving behind a deficit in the educational workforce that grew to meet the onslaught of burgeoning student enrollments in design in the 1980s. Given the current state of the economy, it is likely that colleges and universities will meet continuing enrollment growth in design through new hires from master's programs. These young faculty will be responsible for shaping curricula with little guidance from more experienced (or more entrenched) senior faculty. We might reasonably ask, however, "What are we doing as a discipline to prepare graduate students for this curriculum development responsibility?" Few graduate programs address curriculum and instruction and most institutions are neglectful in building repositories of syllabi and curricular explanations to inform the work of new full-time or adjunct teachers. So most graduate students enter their first academic job with no recourse but to repeat what they have been taught, even when the new institutional context suggests another approach. Were we to address this issue of preparing the professoriate as the partial content of graduate curricula, or as the explicit focus of some graduate programs, we would leverage the system for future gain.

2 GRADUATE EDUCATION TYPICALLY RESIDES IN INSTITUTIONS WITH THE INTELLECTUAL RESOURCES AND HIGH EXPECTATIONS NECESSARY TO MAKE CHANGES THAT ARE WELL-MATCHED TO THE CURRENT CONTEXT FOR DESIGN. Research is an activity that distinguishes professions from trades. As design expands its scope of services, it requires new information and methods. More and more, designers are either asked to predict the outcomes of design action or are accountable to other fields, such as marketing and human factors, which do it for them. On the surface, generating new knowledge appears to be an assignment for doctoral programs, which in design are few in the United States. But there is much debate internationally about the nature of such programs, with many in Europe advocating "practice-based PhDs" in which students reflect on their own behavior as designers, rather than generate empirical findings that are relevant to others. If we can agree within the field about what we mean by "research" and deliver research-ready master's students to PhD programs, we can build the research capabilities of the field and the scholarship of the discipline to better address the intellectual challenges of contemporary design problems. The institutions that are most likely to make such contributions are those with well-established research cultures in other disciplines, which can provide guidance and influence the standards by which scholarship is judged. Investment by the field in these programs, therefore, will yield benefits to practice and the discipline. Such investment includes collaboration with thought leaders in the field about what is most deserving of research attention.

3 GRADUATE DEGREES IN DESIGN ARE NOT REQUIRED FOR MAINSTREAM PRACTICE, THEREFORE, INSTITUTIONS HAVE LESS PRESSURE THAN IN BACHELOR'S PROGRAMS TO CONFORM CURRICULA TO THE MODEST EXPECTATIONS OF STUDENTS, PARENTS AND EMPLOYERS. There is currently great confusion about the value of master's study. With regularity, popular design magazines, such as *Communication Arts*,

publish interviews with famous designers who claim they would be no further along in their careers if they held a graduate degree. Invariably, these articles are written by a designer who never undertook master's study, organized by editors who didn't look far outside the traditional definition of design practice to find people to interview. Unlike undergraduate programs where there is an expectation of general preparation for the job market, master's programs are free to experiment and specialize curricular offerings as long as they maintain sufficient enrollments to satisfy their institutions. Yet historically, much of this experimentation has resulted in doing things *outside* of practice: in developing the student's personal voice; in undisciplined critical reflections about design; or on the pro bono application of traditional methods to under-served populations. While some of this work is important, it rarely reaches the level of exportable concepts that influence practice or methods that can be replicated by the culture at large. And typically, graduate students are not taught how to take this work to the next level through publication and entrepreneurship. So while the appropriate environment is in place for focusing graduate education on the evolving context for design, we are missing its important role as an incubator of new ideas and knowledge—both curricular and practical—that can take on the challenges of a changing profession. Further, we are missing the dialogue among leaders about how programs might direct their efforts toward more ambitious goals for society and the field.

What will it take to shift the mindset of college design programs regarding graduate education and what are the challenges to a transformation of advanced degrees in the discipline?

FINE ARTS AS A MODEL FOR GRADUATE EDUCATION IN DESIGN

The current paradigm for graduate education owes much to the traditional location of design programs in departments and

schools of art. Content, patterns of instruction, values and identity with others are generally defined by this location. We are comfortable with the things we share with the arts (authorship, intuition, subjectivity), yet many of the most pressing issues facing our field have little to do with these attributes. This is not to say that artistic values aren't important and can't find instantiation in design practice, only that they are insufficient alone in defining the nature of contemporary design problems and opportunities.

At the graduate level, painting and sculpture represent the typical MFA model of instruction. Students pursue personal development through self-defined investigations, meeting with others occasionally for critiques and seminars on topical issues. In many schools, design has adopted this model. In some places, design students complete their graduate degrees entirely through independent study and in seminars with peers only from the fine arts. Unfortunately, this situation often has less to do with ideology than with the economics of where tenured faculty reside and how many students apply for admission.

In independent art schools, access to relevant coursework outside of art and design is limited and usually organized around the humanities. Faculty, therefore, rarely direct students to literature in the social sciences and struggle with identifying seminal work and interpreting research findings for their relevance to students' investigations.

Graduate thesis projects often reflect the fine arts context, and while most professional design offices value creative thought, it is difficult to explain how graduate study brings significantly different creative benefits to practice from those of undergraduate education. There are ongoing debates in schools about how much curricular content art and design graduate students should share and whether standards of accreditation discourage study in the areas most in need of development. If we are to view graduate education as a leverage point for responding to change, these issues must be sorted out.

PROGRAM PROLIFERATION

There is anecdotal evidence that the number of graduate programs in design is growing. In many institutions,

graduate students are valued more highly than undergraduate students because of the status associated with having advanced students. In other schools, the interest in graduate study results from the funding model of the institution: more money per student for graduate enrollment; reduced faculty/student ratios in determining class size; and assistantship support for teaching lower-level classes go to departments that offer graduate degrees.

These economic incentives often convince programs to offer graduate degrees in the absence of intellectual resources. Faculty must support the breadth and depth of program content and actively model the research behavior they expect advanced students to learn. There is a difference between what *interests* faculty and what they are *qualified to deliver* as high-level content. So if we look to graduate programs as a leverage point for changing the system of design education, we first need to set a higher bar for program performance.

DEGREES OF SEPARATION

While intellectual resources determine what a graduate program can and cannot do, the majority of American colleges and universities show little differentiation between the published outcomes of undergraduate and graduate design offerings. The presumption in many schools is that graduate students will *do more or be better* at the same things that comprise undergraduate education. This supposition is often reflected in the scheduling strategies of some schools; graduate courses are piggybacked on upper-level undergraduate offerings in which juniors and seniors define the level of performance and discussion.

Further, in order to show acceptable graduate enrollments, many schools use the terminal degree as "change of career" education for students whose first studies are in other fields. Generally, these students don't expect to practice as "hybrids," bridging their first and second disciplines in some research sense. And the graduate design curriculum rarely makes explicit use of their extended knowledge. Instead, faculty attempt to pack six years of practice-based content into two years of instruction and expect graduates to compete successfully for employment with their better prepared undergraduate

peers. Consequently, the profession has little understanding of what a graduate student brings to the workplace besides maturity.

If we expect to meet the challenges of the contemporary context for design, we must study that context for what truly separates *leadership and innovation* from business as usual. We must anticipate new places where design can have influence. And we must address, through research and collaboration with other disciplines, the knowledge shortfalls of the field that result from our evolution from a trade to a profession.

OFF THE CLOCK

Because the historical template for graduate education in design has been independent study in the arts, many programs support curricula through overload teaching. In most schools in the United States, graduate thesis advising is an unpaid supplemental assignment, keeping faculty from their own research and leaving students to beg for valuable faculty time. In some institutions, programs cluster design students with fine arts majors to achieve acceptable enrollments or pay outsiders to interact remotely with their graduate students. In either case, the design program has little control over the content or quality of instruction; others define the reputation of the program.

Another increasingly common practice is to unleash unprepared master's students on more experienced researchers through email inquiries. The email request typically goes something like this…*"I am a graduate student doing my thesis on X and would like your ideas on the topic and any readings you can suggest."* Invariably, the topic is *massive* in scale, making it impossible for the respondent to focus comments or narrow recommended readings. Emailing students frequently complain that they have no mentoring in their programs and seek advice from anywhere they can find it. While technology makes it easy to connect people with similar interests, this advisory practice raises disturbing questions about whether graduate programs are adequately staffed and whether required coursework appropriately supports the kind of study associated with a terminal degree.

If graduate education, therefore, is to fulfill its promise of raising the capabilities of the field, it must be a priority for the schools that have chosen to engage in graduate education.

THE TROUBLESOME TERM: RESEARCH

If our discipline were medicine, we would look to the practice for guidance in setting our research agenda. For example, how many patients have been discharged from hospitals with Type II Diabetes as part of their diagnoses tells us something about the urgency of the obesity epidemic. There is some agreement in the field and in society that this issue is important and funding opportunities reflect that consensus. The standards for judging the quality of research, whether in the social or basic sciences, are in place. And the outcomes of such research are reported to the public and guide the recommendations of practicing physicians.

But design has no common understanding within the field of what is meant by research, no unified theory guiding practice, few research methods that haven't been borrowed whole-cloth from other disciplines, and little recognition by practice and the public of the value of design research findings.

It is difficult, therefore, to determine the paradigms that should guide the development of academic research programs in design and the desired skill set of "research-ready" master's students. Further, there is little agreement of what topics are worth researching, even though so little has been done in the discipline. So there needs to be dialogue among institutions that are serious about design research and greater collaboration with the field in setting a educational path for the future.

These obstacles are daunting but not insurmountable. And there are notable exceptions among the current mix of graduate offerings that make meaningful contributions to the field, despite the challenges apparent under the current system of design education. But there is a sense that design education has reached a threshold, that change is no longer an option but an imperative. I believe schools have a narrow window of opportunity to redirect efforts in ways that ensure the relevance of our discipline to life in the twenty-first century. I also believe that graduate education is a leverage point, that positive intervention in the system at this location will yield disproportionately productive results.

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Stan RUECKER

THE PERENNIAL AND THE PARTICULAR CHALLENGES OF DESIGN EDUCATION

ABSTRACT

Education in design shares with other disciplines a number of perennial challenges, including the need to transfer human culture, the choice of what parts of human culture to transfer and the decision as to what approaches work best in accomplishing that transfer. Design education also faces particular challenges, which are shared with only a few other disciplines. These are a predisposition towards the future, the increasing necessity of interdisciplinary approaches and the value for students in participating early in the culture of research. I argue for curricular advancements to accommodate each of these factors, including in particular a design PhD modeled on the humanities. Finally, I emphasize the importance of providing students with sufficient time to reflect.

"In the case of the designer, the construction or extension or revision of the future artificial is the goal of the activity, and to facilitate that orientation toward change, it is beneficial that practicing invention be part of the education."

EDUCATION HAS A SET OF CHALLENGES THAT ARE PERENNIAL

First is the need for transfer of training, experience, knowledge and insight. Let's refer to these things collectively as the cultural archive. The existence of that archive and its means of transmission is at the center of human culture. The transfer is often associated with youth and age, although it isn't necessarily connected in that way, and with the exponential growth of change, it is increasingly not. What this means for the future of design education is that we can expect the trend to continue where it often happens that students know more about the current environment and immediate future than their instructors know. If our model is education as transmission, we limit the possibilities for combining the various kinds of knowledge available around the table for the best educational advantage. Alternatively, if we accept the concept of knowledge as co-creation in an environment that has been properly scaffolded to support learning, we have opportunities to bring together the best that all participants can contribute for their mutual advantage.

Which leads to the second perennial challenge — determining the extent to which the training, experience, knowledge and insights of one generation or one group of people are relevant to another group. It is often the case that what we have learned is no longer relevant and may even be incorrect. Much of it is culturally bound, with different cultures privileging different parts of the archive, and in addition, culture changes. Further, a significant portion of what we have learned, especially through experience, is essentially an accumulation of mistakes that we would avoid

making again, rather than an accumulation of good strategies that we would leverage for future benefit. As William Saryon's Armenian uncle (*Saryon, 1940*) so eloquently puts it:

> *"It is no harm. Pay no attention to it."*

Yet anything that has consumed our time tends to attract our attachment, so that we feel the necessity of proving that our time was not wasted, by believing that some of that time was well spent in learning valuable lessons. And in order to support the belief that the lessons were valuable, we seek to pass them on to someone else. In essence, we find ourselves in this quandary: "I have spent a lot of time learning things and they are no longer relevant. Now I am in the role of a teacher." This sequence of causes and effects, coupled with belief in the transmission model of education, is a significant part of the desire to use obsolete technologies in the classroom.

Third, given the premise that at least some of our cultural archive is worth transmitting, there is the vexed question of what approaches to teaching and learning actually work. To what extent is it possible, in fact, to teach, or is it best to think that the primary possibility rests with the capacity of the student to learn?

A corollary here is how best to determine whether or not someone is ready to learn, or we may say is at a teachable moment. We have tended to solve this by making learning expensive and hard to get, so that people self-select. But the granularity is too coarse and a lot of potential is left fallow.

A second corollary is the perennial challenge of how to assess learning. Given that someone needs to learn something, at what point is it fairly well established that the learning has taken hold? The best measure of education that I know of is behavioral change. If a person is capable of doing something after being educated that was not possible before being educated, and the person chooses to exercise that capacity, then education has unquestionably taken place. Slippages are possible, however, on any of the components of that declarative statement, and the simplest examples are where education consists of vocational training, which I recognize as only a deprecated subcategory of the more preferred process of education in a general sense.

It is also important at this point to distinguish learning from accomplishment. Someone can arrive at the classroom, for example, already having mastered the material—that is, in a state of accomplishment. That person will score well on exams, but will learn very little. Another person may arrive with no knowledge and gain a tremendous advancement, but score on average poorly on the sequence of exams. This is one of the fundamental injustices for everyone concerned.

As a constructivist and enthusiast for Freire (*1970*), I tend to feel that sufficient time spent in an environment that supports learning is a key element. People arrive at an understanding of the material at hand by engaging with it on their own terms and producing something relevant to the material. In order for students to get the greatest shelf life from the time spent learning, I advocate combining enthusiastic engagement with the material with a meta-reflection on the abstract or philosophical implications of the subject, or perhaps we might say an interrogation of the terms, the context, the felicity conditions and the bounds of discourse around the subject (*Foucault, 1976*). In some ways, the process is possible without a theoretical or philosophical basis, but it is strengthened when such a basis exists. As my colleague Keiichi Sato puts it, we can compare different methods in mechanical engineering because they share the common theoretical basis of Newton's laws of motion (*Sato in conversation*). Design does not yet have the equivalent theoretical basis, although I would argue that both general design theory and human factors has been, and will continue to be, a step in that direction.

DESIGN EDUCATION HAS DOMAIN SPECIFIC CHALLENGES

Now to turn our attention to design education, we face all the perennial challenges of education, and we add a few that are domain specific. Foremost among these is the disciplinary predisposition toward the future. It is necessary but not sufficient for the designer to have an understanding of the past and present, which is where most education has the luxury to end. In the case of the designer, the construction or extension or revision of the future artificial is the goal of the activity, and to facilitate that orientation toward change, it is beneficial that practicing invention be part of the education.

In other domains, invention is largely the privilege of the elite specialist, who has sufficiently mastered the archive to know what are its boundaries. For students completing an undergraduate degree, in whatever field, we ask that they can rehearse a part of the received wisdom in their own words. That is, we want them to have internalized some portion of the cultural archive relevant to their area to the extent that they can talk intelligently about it. For students completing a PhD program, we want them to be able to talk intelligently and comprehensively about a good percentage of the literature relevant to their area (which has admittedly been largely impossible for most domain areas of any appreciable size for more than a hundred years). We also want them to know how to produce research questions and pursue them to obtain valid kinds of evidence and argument. We want them to know how to manage objections. Fundamentally, we expect them to add to the archive, in whatever small proportion, and communicate that contribution in writing, usually at the length of a book. In the middle terrain are the masters students, who may be anywhere in the continuum between those difference poles.

But for design students, the contribution to the future artificial is a kind of addition, at least in potential, to the cultural archive. So it would be beneficial if design students could begin to learn, as early as possible, what is involved in making that kind of contribution, so that more of their efforts have a chance of being included. That is, there is a need for increased participation by students in the culture of design research; the factors relevant to a research contribution should be introduced early, and scaffolded appropriately by the professors who are working with students at different levels of knowledge and experience. These factors include the need to become familiar with the relevant portions of the archive, to be able to formulate research questions and determine what kinds of evidence are appropriate, to collect evidence, analyze the findings and communicate the results.

I have done this kind of research work with over 65 different student researchers in the past ten years, from junior undergraduates at community college to senior postdocs at top-tier research institutions. There is no question that many challenges exist, and that they are different challenges at each stage of the educational and mentoring processes. It also does sometimes happen that students are simply not ready to begin thinking

about research. I would argue that those students might be better off not pursuing university education, since I believe that universities are where we attempt to maintain diversity, as my colleague Susan Liepert has so eloquently expressed it, in the gene pool of ideas (*Liepert in conversation*). For those who are interested and able to engage with research practices at some level, it is useful to be able to identify the points along the continuum at which the student can already contribute, can contribute with some mentoring, and will be able to contribute at some future date, but not at present. One of the outcomes of mentoring in research is to help the student move along that continuum.

In connection with that series of changes, we would like for them, as soon as possible, to begin engaging with the processes of creativity and invention. Some design schools explicitly address these needs, delving into what the cognitive psychologists have learned about the relevant processes. My colleague Ahmad Fakhra has been looking into this area as the subject of his PhD research (*Fakhra and Gregory, 2010*). I believe that there is a good future for this kind of educational innovation, so that future design students will be able to talk with some confidence about the cognitive processes involved in creativity, and will have available a set of toolkits for invoking creative processes as they are necessary.

Another challenge that is not unique to design but is still fairly domain-specific is the need for students to learn about interdisciplinary approaches. Design is one of those (admittedly increasingly common) areas of human activity where the results are better when a group of specialists can cooperate effectively. One pedagogical approach that I have used in this context is the formation for course purposes of interdisciplinary research projects where the student leading each project can only choose team members from among other people who are not in the course. They define the kinds of people they need for the project, then go and recruit. The other team members might be junior colleagues, senior colleagues, or at the same level as the students. They might be from the academy or outside the academy. But the student needs to justify their presence on the team—then manage their efforts to a successful completion of the project. I can see that future versions of this strategy might involve a greater scope, so that there are for instance team members who only participate virtually, or groups who contribute through the

establishment of some "architecture of participation" (*O'Reilly, 2004*). I also foresee an increased role for what we might naively call artificial intelligence on research teams, but in fact this may simply take the form of advanced technologies that we are at this point only able to glimpse.

One of the things those technologies should provide is enhanced access to what will be a better archive specifically in the area of design. There is excellent design research being done in a whole range of areas, and the systems for allowing researchers to discover it, understand or interpret it, and apply it to the next project are among the areas of design research that are advancing. A better archive will provide not only better access to research results, but also improved access to the data, so that it can be re-arranged, aggregated and re-analyzed in new contexts. We should also begin to pay more attention to the idea of replication studies, where previous results are interrogated through researchers re-running studies in different environments. A better archive will also contain kinds of metadata that are not currently available, in order to assist future researchers in discovering relevant studies (e.g., the Scalar project). This metadata may exist within documents, where XML encoding has been applied in interpretations that can be layered over time. It may exist within documents, so that, for example, a researcher could locate previous studies by research method, or by demographics of study participants, or by the statistical measures applied. Finally, it may exist at the level of the collection, so that pre-existing subsets of the archive can be examined along with analysis that has been done on them.

What this implies for the PhD in design is that it should come to accommodate more directly the nature of the field. Many excellent design PhDs at the moment draw their approach from the sciences and social sciences, which produces a good result, but does mean that they tend to sidestep the production of new cultural artifacts in favor of the study of existing cultural artifacts. I am interested in a design PhD that draws instead on the tradition of the humanities PhD, where the research takes an object of study (for example a novel by Dickens) and subjects it to interrogation through some theoretical lens (for example postcolonial theory). The result is that each PhD project, and indeed each instance of subsequent scholarship, is intended to enrich the original object

of study through an accretion of observations, analyses, syntheses and reporting.

For designers, a PhD of this kind would include the production of a sufficient set of new cultural artifacts to constitute an object of study representative of an interesting topic domain (for example an ecosystem of intelligent domestic appliances) coupled with an interrogation of that set of designs through an appropriate theoretical lens (for example the concept of social capital). The discussion in the dissertation will need to include the rationale for accepting the designs as appropriate representations of the topic domain, in addition to the actual theoretical interrogation.

All of this of course takes time, and a final entry in the list of perennial problems of education is to be able to give the students sufficient time to reflect. While it is true that behavior change can be accomplished by putting people on an educational treadmill, the change to behavior in that case will not include the tendency to pause and think things through. If the culture values education, it should not penalize students who would benefit by being able to take some years on a problem and engage it at a sufficiently deep level. As Simon (*1969, 108*) has observed, it takes at least a decade for someone to develop the highest levels of proficiency in a field. Given that the duration seems prohibitive, the potential benefits are also enormous, and I believe we could all benefit by collectively making education a much higher priority than it has been to date.

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Ken FRIEDMAN

MODELS OF DESIGN: ENVISIONING A FUTURE DESIGN EDUCATION

ABSTRACT

This article offers a large-scale view of how design fits in the world economy today, and the role of design education in preparing designers for their economic and professional role. The current context of design involves broad-based historical changes including a major redistribution of geopolitical and industrial power from the West to the East. A model of six global economies delineates the challenge and opportunity for design practice and education. While the six economies developed over time, all fit together now and design creates value in different ways across them. Understanding the economic context of design education gives clarity to the educational mission, differentiating it from other forms of education. The author argues that design professionals now require a broad range of analytical, conceptual and creative skills related to the social and economic context of design along with advanced skills in a design specialty. A taxonomic chart of design knowledge delineates the range of skills and knowledge domains involved.

"Most of today's design challenges require analytic and synthetic planning skills that can't be developed through the practice of contemporary design professions alone."

THE CONTEXT OF DESIGN

> *The future is already here. It's just not very evenly distributed yet.*[1]
>
> William Gibson

The context in which we live exerts a decisive influence on the nature of education and it determines the meaning of what it is to be educated. History, economics and politics shape the nature of our times and the education that suits them. Design education today takes place in the context of a post-industrial society and the industrial society that gave rise to it. It also takes place in the context of the multiple economies that weave together to shape our times. To understand what design education is today—and what it must become—requires us to understand the changing shape of the contemporary industrial economy against the global background of the new Asia-Pacific century.

The rise of China as the world's second most powerful economy challenges the economic and political assumptions of the Western industrial democracies. Eric X. Li recently argued in *The New York Times* that the competition between the West and China is not a clash between democracy and authoritarianism with democracy as an obvious and necessary goal. He argues that a:

> *form of government, or any political system for that matter, [is] merely ... a means to achieving larger national ends.*[2]

Li poses two great Western experiments in democracy against the durability of China. Athens was the world's first experiment in

democracy. It lasted little longer than a century and a half. Democracy in the modern West is the second such experiment, but democracy as a system in which each citizen has one vote is less than a century old.

For Li, the contemporary experiment in democracy dates to the European Enlightenment and the success of the industrial revolution. He argues that the current politics of democracy is leading to the uncontrolled and unequal accumulation of wealth, a form of excess that will shape a modern version of the demagogy that destroyed Athens. Li quotes Nobel Laureate Michael Spence on the shift from "one propertied man, one vote; to one man, one vote; to one person, one vote; trending to one dollar, one vote."[3] This is the heart of special interest politics. While special interests have long played a role in Western democracies, the new form of special interest politics combined with massive wealth renders special interests different from those of the past. In the 1780s, Pennsylvania politician William Findlay articulated the central rationale for interest-group politics. This worked reasonably in the 18th and 19th centuries, a world in which America was one power among many. When America holds a position as the world's most influential economy, the triumph of special interests affect more than the greater society of the United States; they dominate the globe.[4] Today, the once-plausible democracy of Findlay's special interests has given way to the paid-for politics of the new demagogues. One result is the struggle of Western industrial economies, and the difficulty they have creating enough decent jobs to support all their citizens with dignity. Since most design professions involve shaping goods and services within large industrial economies, this political-economic context is one key to the realities of design education today and tomorrow.

The profession for which we educate designers today takes place against a context with several dimensions. One of these is the context of the democratic industrial societies that gave birth to and require design services. At the same time, other models of industrial society are reshaping the world.

The clash between Chinese dissidents and the government at Tiananmen Square in 1989 rendered the conflict between the democracy of individual freedom and organized state economies visible.[5] The conflict became visible again in the global financial crisis of the current decade. The radical power of financial interests

to uproot businesses and destroy individual lives has grown in the wake of deregulation. In this era, legislators in the world's greatest industrial economy redesigned the tax system to distribute wealth upward to the wealthiest one tenth of one percent of the population, increasing their wealth and their capacity as an interest group to reshape the economy in a way that increases the wealth of those who benefit from systemic change despite the fact that the system as a whole grows poorer. On a global basis, an even smaller percentage of the world's population shares the world's wealth. One result has been to hollow out manufacturing and the productive capacity that once defined industrial democracy.

The contest between self-interest and common concern forms the ethical background to the state of today's industrial democracies. Civic pride and a sense of the common good led Aeschylus to define himself as a citizen who fought against the Persian empire at Marathon to defend democracy. The epitaph of Aeschylus commemorates his service as a soldier and not his stature as the father of dramatic tragedy or his many honors.[6] In contrast, many leading citizens in the West today define themselves by their wealth and the businesses they control, buy and sell.

This vision of capitalism would hardly have seemed likely during the decades when design education entered the university. Adam Smith—the first great economist—developed the discipline of economics as an extension of moral philosophy by asking a powerful question: what conditions create productivity and prosperity for a society as a whole and for the greatest number of citizens? In an elegant essay conceived as he wrote a new introduction to Smith's *Theory of Moral Sentiments*[7], Nobel Laureate Amartya Sen notes how badly the apologists of modern wealth have distorted Smith's ideas.

We live today in a world of genuine competition between models of industrial society. The Soviet economy was an illusion, and competition between economic models was never a serious issue. The Cold War involved unequal competitors. In the West, productive industrial democracies devoted a small part of their massive surplus to political, military and economic struggle among nations. In contrast, the Soviet Union used core capacity to the same ends, destroying wealth to do so rather than using surplus. Today's geo-political competition is a stark contrast to this. The capitalist economies of Asia—including such state capitalist economies as

China—are creating wealth. The economies of the United States and many parts of Europe are destroying wealth as they shift resources from productive use to financial manipulation. While this involves complex factors, a few key issues stand out.

The first issue involves a geo-political transformation defining the end of the twentieth century and the start of the twenty-first. In 1987, I lectured at the Technological University of Delft on the role of cities in the changing world economy. I was working at the time in Finland as visiting designer at the great ceramic and glass firms Arabia and Iittala. From Helsinki, the most visible factor in the shift between East and West was so simple that an America consumed by the contest between American and Japanese automotive industries overlooked it. This is the fact that for nearly ten thousand years of recorded history, the vast majority of the world's wealth was located in Asia, along with the vast majority of the world's people. This changed over the most recent five centuries, in great part because of political decisions made by Asian governments. In the 1400s, China began a great withdrawal from the world, relinquishing its role as the world's foremost maritime power to focus on the inland regions. In the 1600s, the Tokugawa shoguns sealed Japan from the world with a closed country policy. At the same time, the Mughal emperor Jahangir permitted the British East India Company into India with powers that would eventually make India a dependency of the British crown. As a result, foreign powers determined the fate of Asian nations, deflecting the rise of Asian economies for five centuries. When this era came to a close, it seemed inevitable that natural resources and human capital would return Asia to its former status as the world's most prosperous region.[8] The condition for this rise was good governance and responsible geo-political strategy. The major economic powerhouses of Asia have in great part had both.

While Western democracies contest the politics of Asian governments as authoritarian, one must question the nature of any democracy that we can define, as Spence does, with "one dollar, one vote" politics. Whatever one can say of the West, there is no question that the "Four Tigers" of Hong Kong, Korea, Singapore and Taiwan, have joined Japan as massively successful economies. India has made major gains in recent years. Most important, some predict that China will overtake the United States as the world's most powerful economy by 2030,

though it will take slightly longer for China to surpass the West in per capita income and overall geo-political power.[9] Even so, Asia as a whole is surpassing the West. Design education takes place against the background of this global context.

SIX WORLD ECONOMIES

The professional practice of design is an economic activity. Different forms of design function in specific sectors and niches of the economy. In 1940, the Australian economist Colin Clark divided the economy into three sectors: primary, secondary and tertiary. The primary sector extracts wealth from nature through agriculture, livestock, farming, hunting, trapping, fishing, forestry and basic mining. Secondary sector industries transform extracted material through human activity in manufacturing, building, construction, mining, gas, oil and power production. The tertiary sector provides services through commerce, distribution, transport, public administration, domestic services, personal services and professional services.[10]

A quarter century later, sociologist Daniel Bell redefined economic activity in his landmark book, *The Coming of Post-Industrial Society*. Bell reworked Clark's typology, deepening and expanding it to cover the more complex economy of the post-war era. Bell's work structured a typology of economic sectors that revealed the era in which each sector emerged. The primary sector of the economy is pre-industrial, typified by agriculture, mining, fishing, timber, oil and gas. The secondary sector of the economy is industrial, expressing itself through goods production, manufactured durables, manufactured non-durables and heavy construction. In contrast, the post-industrial economy was far more variegated, with three sectors. The post-industrial tertiary sector involves transportation and utilities; the post-industrial quaternary sector involves trade, finance, insurance and real estate; and the post-industrial quinary sector involves health, education, research, government, recreation and entertainment.

More important, Bell articulated important shifts in the way societies and economies work, as well as the axiological implications of these shifts.

Modes of production shifted from pre-industrial extraction to industrial fabrication to post-industrial processing and information

technologies. The strategic resource of the pre-industrial era was raw materials. This shifted to financial capital in the industrial era and human capital in post-industrial times.

The resources that transformed these from resources to goods and services while adding value to them also shifted. They went from the natural power of wind, water, draft animals and human muscle in pre-industrial times to the manufactured energy of steam, electricity, coal, oil, gas and nuclear power in industrial times to the information, knowledge processes, programming, algorithms, computers, data transmission and human interaction of post-industrial times. It is vital to note that even though transforming resources change, human beings continued to work with earlier resources and processes. We still required raw materials for manufactured goods. High quality food production in restaurants relies still on human energy as its major transforming resource. El Bulli pioneered a post-modern molecular cuisine while The Fat Duck emphasized a gourmet version of the traditional country kitchen. Both require master chefs.

Technology shifted from craft technology in pre-industrial times to machine technology in the industrial era and then to intellectual technologies of the post-industrial era. The skilled labor base shifted at the same time from pre-industrial artisans, manual laborers and farmers to industrial engineers, semi-skilled workers and skilled workers onward to post-industrial scientists, technologists and professionals, along with highly skilled workers.

Modes of work shifted as well. They went from physical labor in pre-industrial times to division of labor as the definitive mode of the industrial era to networked labor in post-industrial times.

Methods and methodology shifted from common sense, trial-and-error and experience in the pre-industrial age to empiricism and experimentation in the industrial age to models, simulations, decision theory and systems thinking in the post-industrial age.

The two greatest shifts involved time perspectives and the axial principles that define each age. The pre-industrial era was oriented to the past. The industrial era used ad hoc adaptation and experimentation, working at scale in the industrial setting. The post-industrial era is oriented toward the future with forecasting, foresight and planning. The great axial principle of pre-industrial times was traditionalism. This shifted to the guiding principle

FIG 1.
Six Global Economies
KEN FRIEDMAN

Six Global Economies	
Economy 6	Direct action on biological, molecular, and atomic structures
Economy 5	Information, knowledge services, emotional work, human networks, experience economy services, professional services, cultural services
Economy 4	Commerce, capital services
Economy 3	Transport, utilities
Economy 2	Fabricating, building, construction
Economy 1	Gathering, harvesting, hunting, husbandry

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of productivity in the industrial era. In post-industrial times, codified knowledge and algorithms became the central focus.[11]

A new model of six global economies accounts for the structural elements of the economics sectors from the earliest times to the most recent. ECONOMY 1 involves gathering, harvesting, hunting and husbandry. ECONOMY 2 involves fabricating, building and construction. ECONOMY 3 involves transport and utilities. ECONOMY 4 involves commerce and capital services. ECONOMY 5 involves information and knowledge services, emotional work, human networks, the experience economy and cultural services. ECONOMY 6 is the economy of direct action on biological, molecular and atomic structures.[12]

The first economy began with our pre-human ancestors. So did the second economy, when homo habilis manufactured the first crude tools 2,500,000 years ago. While the emergence of transport as an economic sector depends on the definition of transport, the crudest forms of transport must have begun at around the same time as tool making. Definitions also affect the ways we date commerce and capital services. Long-distance trade began at least 150,000 years ago, but money as we know it is relatively recent, dating to the 6th century BCE. Commerce and capital services of different kinds appear at all stages of human civilized life, since human beings required commercial and capital services of some kind for the formation of cities, states and organized human activity. The economy of fabrication also shifts in relation to commerce, capital services and social structure, and millions of years separate

the manufacture of stone tools from the manufacture of bricks, buildings and temples. Recognizable information artifacts date back at least 20,000 years, but organized information systems emerge with the birth of the first cities. All of the first five economies have co-existed for at least 10,000 years in different configurations.

Old economies and new are interwoven: the proportions change over time. Ancient Egypt had agriculture and construction, along with information and knowledge services. Egypt employed massive numbers of agricultural workers, drafting some for construction. It had few information managers and knowledge workers. Ancient Egypt also had an experience economy, though professional experience providers primarily served the aristocracy and upper classes gathered around the royal family. Classical Athens had fewer agricultural workers than ancient Egypt relative to the population and far more professional construction workers. While there were still relatively few information managers and knowledge workers, there were far more relative to the population. The proportion of professional experience providers was significantly greater, however, with larger and wealthier merchant classes to serve along with aristocrats, and the great civic drama festivals. At any moment in human history, one can see the shift of different proportions of workers and professionals working in the different sectors.[13]

The definitive change to the 21st century economies is the birth of a new economic sector, a sixth economy of direct material technologies. These technologies use the power of new materials and new technology through direct instructions that shape artifacts at many scales. The economy of direct action on biological, molecular and atomic structures involves the important and growing sectors of biotechnology, nanotechnology, additive manufacturing and other new fields.[14]

The crucial issue here is that the era Bell identified in the 1970s as post-industrial did not mean an end to industry, but rather a shift to layered economies functioning in different ratios to times past. The increased capacity for productivity in highly informated factories means a need for increasingly valuable output in any society that hopes to keep its citizens employed. This, in turn, requires increasing improvements to products and services of all kinds. Nations that maintain a highly skilled manufacturing base with an educated population of skilled professionals and highly skilled workers have a future in today's

world. They will be able to maintain a full spectrum of economic sectors, providing goods and services both to the rest of the world's economies. Nations that lose the capacity to manufacture will be incapable of functioning across the full spectrum of sectors.[15]

WHAT DESIGNERS MUST KNOW

To work effectively in the complex contemporary economy, top-flight design professionals require a range of skills and knowledge. These include the same range of general skills and background knowledge that all practicing professionals require along with the domain-specific skills and technical skills of each professional practice.

Design is an interdisciplinary profession serving multiple needs. Designers work in transdisciplinary teams whose nature and constituency changes according to the project at hand. For this reason, it is difficult to argue for a definitive range of skills or even a specific series of knowledge domains. In educational terms, these change depending on the location and focus of the program and curriculum. Even so, it is possible to suggest a typical taxonomy of domains that one might expect to see in a strong, contemporary design school[16] (*see* FIGURE 2).

What is most to the point is the fact that designers must learn more than they once had to learn to succeed in a first-rate design program. When they graduate, they must know more than they once had to know to work at the upper levels of the profession, and they require a higher level of integrative skills to succeed.

Donald Norman describes the key issues in a recent article on the changes required for design education today.

> *In the early days of industrial design, the work was primarily focused upon physical products. Today, however, designers work on organizational structure and social problems, on interaction, service, and experience design. Many problems involve complex social and political issues. As a result, designers have become applied behavioral scientists.*

He goes on to explain the problems of contemporary design education, writing,

Learning & Leading	The Human World	The Artifact	The Environment
Problem solving **Interaction method** **Coaching** **Mind mapping** **Research skills** **Analysis** **Rhetoric** **Logic** **Mathematics** **Language** **Editing** **Writing** **Presentation skills** - Public speaking - Small group - Information graphics	**The Human Being** - Human behavior - Information semantics - Knowledge creation - Physiology and ergonomics - Psychology - Behavioral economics - Research and methodology **The Company** - Organizational management and behavior - Business economics - Company culture - Leadership - Administration - Future planning - Process management - Change management - Process skills - Company functions - Governance - Logistics - Production - Marketing - Finance **Society** - Trends - Legal issues - Media - Social economics - Communication **The World** - World trade - European Union - USA - Asia - Cross-culture Issues - Political economics **Theory Basics** - Culture theory - Sociology of knowledge - Reception theory - History of design - Sociology of taste - Content analysis - World history - Paradigm analysis - Models	**Product Development** - Methodology - Market research - Innovation research - Problematics - Product generation - Creating new products - Transforming old products - Product regeneration - Correcting problems - Improving products - Positioning - Re-engineering (lean production) **Design** - Product design - Ergonomics - Product semantics - Product graphics - Functionality - Graphic design - Visual ergonomics - Typography - Corporate design - Behavioral design - Information design - Knowledge design - Process design **Manufacturing** - Technology - Operations - Statistical quality control - Logistics - Process management - Additive manufacturing - Nano-technology - Bio-technology	**Natural environment** - Ecology - Evolution - Environment - Impact **Built Environment** - Cityscape - Economy - Social web - Infrastructure - Traffic **Telecommunication** - Airports - Food distribution - Human ecology **Architecture** - Informated buildings - Usage - Architecture as idea - Architecture as corporate identity - Profile architecture **Interior** - Furniture - Interior as corporate identity - Psychology - Function - Social structure - The shape of work - The shape of play - The shape of private life **Installation** - Philosophy of space - Culture theory - Art ideas - Inquiry

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FIG 2.

Strategic Design Taxonomy: Design Knowledge Domains
KEN FRIEDMAN
FACING PAGE

> *They are woefully undereducated for the task. Designers often fail to understand the complexity of the issues and the depth of knowledge already known. They claim that fresh eyes can produce novel solutions, but then they wonder why these solutions are seldom implemented, or if implemented, why they fail. Fresh eyes can indeed produce insightful results, but the eyes must also be educated and knowledgeable. Designers often lack the requisite understanding. Design schools do not train students about these complex issues, about the interlocking complexities of human and social behavior, about the behavioral sciences, technology, and business. There is little or no training in science, the scientific method, and experimental design.*[17]

The problem lies partly in the structural position that most design schools have in the larger universities that house them. Many design programs in North America or Europe are located within an art school or a faculty of art and design. In Australia, this is often combined with architecture. This is not bad—studying design, like studying art, philosophy or sociology—is a good way to prepare young people to think about life. Even so, design work now requires designers to create value for industry and business. The specialist professionals we educate for this work need two kinds of education. One is specialty training in the advanced skills of a specific design practice. The other is a broad training that involves the kinds of thinking and knowledge designers need for a wide range of professional engagements.

In a broad framework, designers must bring four sets of skills to bear on the problems and challenges that confront them. These four sets of skills comprise four approaches to value creation, (*see* FIGURE 3). Göran Roos labels these approaches as:

1 _____ **SCIENCE AND TECHNOLOGY**
2 _____ **DESIGN**
3 _____ **ART**
4 _____ **HERMENEUTICS**

By bringing skills and knowledge from these four domains to bear on the challenges that clients and customers bring them, designers create value in the products, services and processes they develop. For Roos,

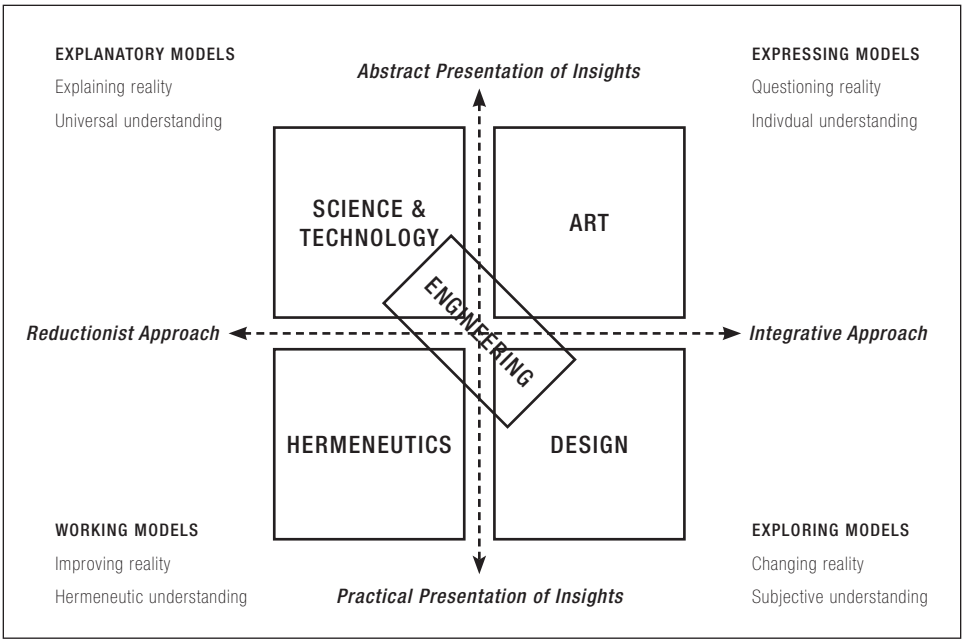

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FIG 3.
Summary of Value Creation Approaches
GÖRAN ROOS

> *The most common objective of design in the innovation process is to change the behavior of individuals who use a designed artifact in such a way that the user perceives that his new behavior improves his life. As a consequence, when the user adopts the new behavior, the provider of the designed artifact also becomes better off, as do other members of the ecosystem surrounding the product or service. ... The Apple iPhone is a good example of this. Users of this artifact change their behavior due to the user interface and the capabilities of the iPhone. One aspect of this new behavior includes buying and using applications as well as increasing data use. As a consequence, the user feels better off. So do telecom operators, application providers, and Apple itself as a producer and business model innovator.*[18]

Designers use three routes to shape behavioral change: they enable desirable behavior by making the behavior easier for the user than alternate behaviors; they motivate users to modify or change behavior through education, incentives, attitude change or other mechanisms;

they sometimes push users to desirable behavior by making alternate behaviors impossible, difficult or prohibitively expensive in economic or social terms.

> *No matter which combination of these routes a designer chooses the principal design method is the same. It is basically made of the following steps:*
>
> *1 _____ Understanding the user through observation and engagement that enables the design to articulate the problems that the user perceives. This draws on design ethnography, which we can describe as a way of understanding the particulars of daily life in such a way as to increase the success probability of a new product or service or, more appropriately, to reduce the probability of failure due to the failure to understand the basic behaviors and frameworks of artifact users.*
> *2 _____ Generating or co-generating ideas around possible solutions. This draws on brainstorming and participatory design techniques.*
> *3 _____ Producing rapid prototypes or mock-ups of the selected sub-set of possible solutions. New techniques and tools including 3D printing and virtual reality simulation substantially facilitate this process.*
> *4 _____ Refining or co-refining embodied solutions. This is an iterative feedback loop that takes place until the desired outcome is achieved.*
> *5 _____ Verifying a successful outcome. This normally requires covert or overt observational techniques involving user groups that have not previously been involved in the process.*
> *6 _____ Implementing the product or service. This normally requires socialization activities in addition to operational activities.*[19]

While Roos takes a technological approach to these issues, he is keenly aware of the human dimensions of the products and services we design.[20] In effect, products and services shape the world around them through their interaction with human users. Henry Petroski charts the interplay between products, those who use them, and the

next generation of each evolving product in *The Evolution of Useful Things*, a book discussing the tools that humans create from forks and paper clips to hammers and zippers.[21] To paraphrase Winston Churchill's comment on architecture,

> *We make our tools and then our tools make us.*

The difference between design education today and design education over the past century is that designers must now strategize the tools they shape through the post-industrial processes that Bell described. Where design once relied on craft guild traditions functioning in slow evolutionary patterns based on common sense, trial-and-error and experience we now use models, simulations, decision theory and systems thinking in the post-industrial age. To do this successfully, designers need a wider range of skills based on research. W. Edwards Deming describes this as profound knowledge, comprised of:

> *four parts, all related to each other: appreciation for a system; knowledge about variation; theory of knowledge; psychology.*[22]

No matter which range of issues and domains any designer must master, the design profession now rests on a range of disciplines (*see* FIGURE 4). The broad disciplines of

1 _____ THE NATURAL SCIENCES
2 _____ THE HUMANITIES AND LIBERAL ARTS
3 _____ THE SOCIAL AND BEHAVIORAL SCIENCES,

inform those areas of the design professions that serve:

4 _____ THE HUMAN PROFESSIONS AND SERVICES
5 _____ THE CREATIVE AND APPLIED ARTS
6 _____ TECHNOLOGY AND ENGINEERING

As a practice, design faces ten major challenges today: three performance challenges, four substantive challenges and three contextual challenges. The performance challenges of design are to:

1 _____ Act on the physical world.
2 _____ Address human needs.

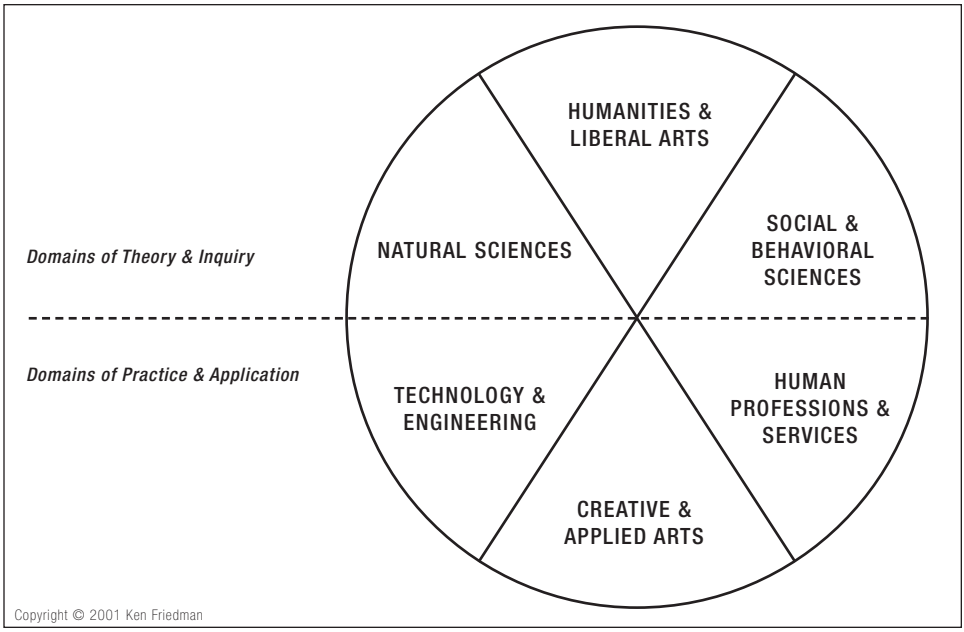

FIG 4.
Design Domains and Disciplines
KEN FRIEDMAN

3 _____ Generate the built environment.

These challenges require frameworks of theory and research to address contemporary professional problems and solve individual cases. The professional problems of design involve four substantive challenges:

4 _____ Increasingly ambiguous boundaries between artifacts, structures and processes.
5 _____ Increasingly large-scale social, economic and industrial frames.
6 _____ An increasingly complex environment of needs, requirements and constraints.
7 _____ Information content that often exceeds the value of physical substance.

In an integrated knowledge economy, design also involves three contextual challenges. These are:

8 _____ A complex environment in which many projects or products cross the boundaries of several organizations, stakeholder, producer and user groups.

9 _____ Projects or products that must meet the expectations of many organizations, stakeholders, producers and users.

10 _____ Demands at every level of production, distribution, reception and control.

These ten challenges require a qualitatively different approach to professional practice than was needed in earlier times. Past environments were simpler. They made simpler demands. Individual experience and personal development were sufficient for depth and substance in professional practice. While experience and development are still necessary, they are no longer sufficient. Most of today's design challenges require analytic and synthetic planning skills that can't be developed through the practice of contemporary design professions alone.

Today, professional design practice involves advanced multi-disciplinary knowledge that presupposes interdisciplinary collaboration and a fundamental change in design education. This knowledge isn't simply a higher level of professional education and practice. It is a qualitatively different form of professional practice. It is emerging in response to the demands of the information society and the knowledge economy to which it gives rise.[23]

We already face the challenges of future design education. If, on the one hand, these challenges are not evenly distributed, neither are the skills or capacities that design schools need to meet them. The design education we need today is increasingly similar to the requirements of professional education in engineering—or, perhaps better said, it is increasingly similar to the requirements of education in health care and medicine. To succeed, outstanding professional design requires a foundation based on science and on research. To serve human beings, outstanding professional designers must master an art of human engagement based on ethics and on care. Design education must foster such skills and knowledge.

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According to Wood, "Findlay set forth a rationale for modern democratic interest-group politics that has scarcely been bettered. Findlay argued that since everyone had interests to promote, self-made middling men like himself, who had no lineage, possessed no great wealth, and had never been to college, had as much right to political office as wealthy gentry who had gone to Harvard or Princeton. This was what American equality meant, he said. Furthermore, since everyone did have interests to promote, it was now quite legitimate for candidates for public office to campaign for election on behalf of the interests of their constituents."

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20 Göran Roos is chairman of VTT International, the Technical Research Center of Finland, and he is professor of strategic design at Swinburne University of Technology in Melbourne, Australia. Originally trained in mathematical physics, he became an engineer, and the founder of over a dozen companies in different fields of technology.

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LAMENTING THE BIRTH OF A DYING FUTURE

Dietmar R. WINKLER

→

Dietmar R. WINKLER, professor emeritus, University of Massachusetts Dartmouth, looks back at decades of experience as a communication designer and design educator in the roles of professor, director and dean. Since 1960, he has been and is still seriously concerned about the slow and arduous process of turning the design vocation into a profession, by examining and writing about issues affecting professional design practice and communication design education. His interdisciplinary interests have been to expand the narrow traditional visual form and function literacies to include user-based design, especially in relationship to behavioral, social and cultural contexts.

Nostalgia has no children

Nostalgia,
the frightful, cowardly hag,
is weaving fantastic tales,
about those days of yore.
Baring her sores
through threadbare cloth
unable to hide herself,
as putrid tea bags do
or when spoiled soups rot
attracting blue flies
to long dead facts
on barely recognizable corpses.
Unable to see the
falsehood of her yarn,
she spreads
her pernicious gossip,
her pestilence,
her sickly breath,
portending that change is
a malignant, apocalyptic
disaster.

Nostalgia,
the frightfully gaudy hag,
made up in garish garments,
sparkles only
in the failing light,
unable to shine
in the bright of day,
balefully barking
at the moon,
is the poisonous bane
to life,
accepting no metamorphosis
no evolution,
salvation was and
can't ever be,
and therefore
vivid energy
is apprehended,
braked by fear,
all positives removed,
forced into a mire,
the quality of
contemporary life
throttled by the past's
slow motion,
yesterday's gem,
the grain of sand
in the cogs of today's
futurist machinery
halting.

Nostalgia's children,
all have died, stillborn or
strangled by her
at birth.
She smothered them
to preserve herself
to molder
in the glitzy sugar coated palace
stuffing herself,
gorging on the
sticky candy left for her
by her own legacy: Nostalgia.

**Nostalgia and her
children are dead,**
why then does the future
have such little chance
of putting creativity, vitality,
honesty and life,
putting the "real" back
into integrity?

→

It is increasingly clear that the content knowledge that designers need to be aware of is expanding. This follows from many of the comments in this special issue. While it is easy to be immersed in the structure of language, imagery and the world of sensory attributes, reading to expand contemporary understanding of the broad issues that affect our lives, our work and those we wish to serve, is also essential. The books the journal reviews cover a broad spectrum of ideas—from new to classic, technological to humanistic, scientific to designer-oriented —and all cases in between. It is in this spirit that book reviews are offered.

The following books are reviewed by Sharon Poggenpohl, editor of Visible Language.

BOOK REVIEWS

DESIGNING DIAGRAMS, MAKING INFORMATION ACCESSIBLE THROUGH DESIGN

JAN GAUGUIN
AMSTERDAM, NL: BIS PUBLISHERS, 2011
ISBN 978-90-6369-228-5
HARDBOUND, 199 PAGES, ILLUSTRATED, FULL COLOR, $49.00

Never, perhaps, has the diagram been needed more. We are adrift in bits and pieces of information, when we need to grasp the interrelationships and patterns that result. The stand-by pie, bar and line charts cannot fulfill all the information needs we have. Even dressed up by design, they are not adequate. Designers need to understand the language of diagram creation in order to translate data and relationship into intelligent tools for understanding.

Jan Gauguin's book begins as a kind of primer into the syntactic, structural, basic design considerations that form a diagram; this is accomplished at a generic level. He provides pointers to more in depth resources on these fundamentals (color, typography, proportion, etc.). In essence, he deconstructs the elements with which designers work in the creation of diagrams, and gives alternative renderings using the basics. This is all by way of demonstrating the possibilities of visual construction. There is a language underlying the construction and its perception, and the author wants to reveal it.

Many books on diagrams simply classify types and show interesting and effective examples. Such books fail to decode the options, interactions of visual elements, or the issue of revealing important patterns through understanding the content and meaning of the material at hand. Working from raw data,

diagrams can be structured in different ways that reveal or emphasize different aspects of the information. Designers need sufficient numerical literacy to actively participate at this level.

The section on Geographic Information Systems (GIS) and Geographic Positioning Systems (GPS) expands the diagrammatic possibilities that technology provides. (PowerPoint is also presented with critical commentary in this section.) The author thinks GIS presents significant new diagram possibilities for designers through selection of views, layers and the possibility to graft other diagram forms into relationship with a base. Use of GIS requires the designer to think through the possibilities and have a clear vision of what is to be communicated. Interesting communication reception questions arise from this. How much information can be synthesized in an effective way using these tools? Does the designer understand the data; its meaning as revealed through some diagrammatic configuration?

The book focuses on diagrams as completed communications. But they are also planning tools, GIS appears to be powerfully able to support synthesis of what is, and a projection of what could be. Design and civic teams with multi-disciplinary backgrounds can use diagrams to project and understand the possible outcome of decisions. I wish the book contained some even quick and dirty process examples of this kind of application.

What is also missing is time as a design element in sequencing information, and time with its ability to reveal change and alternatives. I realize this is difficult to encompass in the format of a book but snapshots of a sequence are possible, or posting a live, real time demonstration on the web to accompany the book. Time is a relatively new design element for most, especially when it comes to information in diagrammatic form. Yet this approach will no doubt become common in the future as the need to coordinate dynamic information becomes essential.

The book ends with a Designer's Gallery that shows some brief case studies demonstrating diagram systems, diagrams as wayfinding tools, as information installations in museums and galleries and as organizational tools that reveal what is hidden. This is followed by a glossary and reference list. It should be mentioned that the author is careful to indicate which of his diagrams are done by hand and those accomplished by software, and those that are the product of a software template.

Undergraduates in design programs that focus on information design will find the beginning structural discussion and demonstration useful as will teachers in that area. The section on GIS and GPS will be of interest to practicing designers, especially those interested in technology and its impact on how we synthesize information and use it.

DESIGNS OF THE TIMES, USING KEY MOVEMENTS AND STYLES FOR CONTEMPORARY DESIGN

LAKSHMI BHASKARAN
NEW YORK, NY: BARNES & NOBLE, 2009
ISBN 978-1-4351-1439-5
HARDBOOUND, 256 PAGES, ILLUSTRATED, FULL COLOR, $175.00

A reference book, it covers many movements that spawned new ideas and applications in architecture, art, product design, furniture and graphic design from 1850 to the present. Key characteristics and facts related to a movement's philosophy or intention are briefly presented along with pointers to other related movements. It is an ambitious undertaking to represent the many major and minor movements, and sometimes it is controversial in that the reader/viewer may not agree with the selection of representative artifacts or the key figures the author chose to exemplify the movement. While the information is carefully structured, one wonders why some movements are covered in many pages and others only briefly. Does this reflect the movement's importance, its extensive application, problems with access to example images, or the author's interest and knowledge?

The book covers movements originating in many different countries, but all have a western perspective. One movement of substance is notably missing, Fluxus, which can be thought of as an extension of Dada.

Some styles enjoy a renaissance or at least key aspects of the style are found anew. To support this perspective, the author illustrates historic and contemporary examples of the style. The interpretation of contemporary work in terms of an old

movement also may be controversial. Is there no philosophy, set of values, or social consideration beneath contemporary work? Synthesis is a goal in this book; seeing the interrelationships between and through timelines of designs and designers.

Where to see various movements, in museums, libraries, stores and other venues is a useful resource in the concluding pages. The further reading suggests deeper investigation, but it is a curious list joining contemporary books with classic accounts by either historians or participants in a movement. No doubt the author wanted to have an abbreviated list, but this doesn't do justice to the ideas sketched in the survey. A brief statement regarding the selection of further reading would be useful.

This brings us full circle to the introduction in which the author states: "Designers today find themselves immersed in choice, free to cherry pick from the plethora of stylistic attributes at their disposal, to mix and match past and present in search of the future." This is the idea and context for the book; an updated stylebook. Is it useful? Students can easily grasp movement relationships through the book's survey format, but deeper understanding of what inspired a movement or the range of the movement's visual character will elude them. Developing an understanding of design history requires interest and immersion in many versions of history. It requires careful, critical looking, understanding the cultural, social and economic context in which a movement appears, along with questioning whether the contemporary situation is an extension or counterpoint to it. Style can be imitated as an empty fashion statement and apparently this is a large part of the author's intention. This particular rendering of a style survey fulfills its goal, it is a reference that supports imitation.

LAWS OF SEEING

WOLFGANG METZGER

CAMBRIDGE, MA: MIT PRESS, 2006

978-0-262-13467-5

HARDBOUND, 200 PAGES, ILLUSTRATED, BLACK AND WHITE, $48.00

The reissue of Wolfgang Metzger's book Laws of Seeing makes accessible once again the experimental demonstrations and conclusions

drawn by gestalt psychologists. The original book from 1936 was ahead of its time in that the experiments and demonstrations in the book are interactive. The author encourages the reader/viewer to do this or that with the page or their visual focus in order to make the material come alive—personally. Metzger confirms the intrinsic orderliness of perception, "Thus one could say in a somewhat facetious way that even the most disorderly human being has at least, without realizing it, eyes that love order....Otherwise...we would see the world filled with unthinkable deformities." I interpret his use of 'unthinkable' to mean useless, confusing, counterproductive to understanding.

While design is often playful and pushes a creative edge, there are many times when clarity, ease of use and understanding are the fundamental need. It is at these times that ideas about human perception come to the fore. One need only consider the chaos of some websites and the frustration endured when trying to find some information, or the flashing, annoying ploys to get attention. I am continually surprised that design programs fail to cover perception and more particularly gestalt principles as such understanding is basic to making sense of the visual world. While this is a scholarly book rather than the picture book so dear to designers, a creative teacher could take the ideas and simple demonstrations contained in this book and illustrate them with design artifacts. While scholarly, the language is not ponderous or technical, and the images while appropriate are not aesthetically rendered. Even the language of gestalt, figure-ground, proximity, similarity, closure, good continuation, etc. offer a language that has substantial meaning and can be used in design critique to anchor discussion; removing the discussion from vague pronouncements.

Whether this was a product of perceptual study or intuition based on a philosophical idea, Modernism with its penchant for order, used gestalt principles smartly. Post-modernism turned its back on simplicity and order. But now, given our complex technological age that keeps evolving (some would say planned obsolescence is ever more the issue), simplicity is once again needed. And it is served by gestalt principles. Yet in design education, they are largely ignored.

Gestalt principles have application in music, movement and visual form. And they are still being investigated. They serve as an underlying structure sympathetic to how we make sense of the

sensory world. If we desire to make ideas and things more easily understood and provide pleasure for the user, gestalt ideas need to be a part of our repertory.

VISION IN DESIGN, A GUIDEBOOK FOR INNOVATORS

PAUL HEKKERT AND MATTHIJS VAN DIJK
AMSTERDAM, NL: BIS PUBLISHERS, 2011
ISBN 978-90-6369-205-6
HARDBOUND, 336 PAGES, ILLUSTRATED, SOME IN COLOR, $59.00

Since the work of Christopher Alexander and J. Christopher Jones in the 60s and 70s, design methods have been controversial. Arguments against methods have been based on their formulaic nature or focused on what aspects of design they ignore. For many they have been viewed as a technique that impedes creativity with their rational approach. In keeping with more scientific or objective design perspectives, the designer held their personal or intuitive ideas in check and became an instrument for rational analysis and decision making with regard to design process. Also prevalent in these early years was a problem-solving approach that also emphasized the logic, constraints and criteria that would guide solution. More than anything, the view of design methods as rigid frameworks undercut use.

Yet design methods can be useful in many ways, as an agreed upon process among multidisciplinary participants, as techniques to synthesize research and even facilitate new ideas, or as ways to open up difficult problems. Vision in Design (ViP) goes beyond the organizational and functional reasons for methods, and speaks to the issues that prompt designers to ignore methods: feelings, creativity, intuition and values. Designers have never liked to accept external rules and have seen methodology as a straight jacket, or industry rules as too confining and predictable. The methodology promoted here argues that the designer sets the context, not in isolation but informed by factual information, principles, trends—and includes the designer's own subjective feeling and intuition that may lead to artfulness and something new. Integration of the designer's values and feelings help create the 'soul' of a design and emerge from freedom, autonomy and responsibility.

ViP is a design methodology—it is:

1 _____ context-driven in that the designer constructs the context
2 _____ interaction-centered in that the designer defines meaning and action
3 _____ human-centered in that the designer is cognizant of human nature and behavior as established culturally and economically.

The design process (it is called a process in deference to the baggage associated with method, or methodology) is detailed step-by-step and some of the student case studies are outlined based on these steps. The process has been a teaching tool at TUDelft for some time.

Whether or not you embrace the ViP process, the interviews and essays are provocative for anyone engaged in design: practitioner, teacher, student or client as they openly address the conundrum of design. The authors have created a process that acknowledges and crosses the gap between right- and left-brain activity. The student and professional design cases bring an abstracted process to realization.

As one would expect from the Dutch, the book is thoughtfully and handsomely designed; it can provoke, stimulate and serve the entire design community, including teachers, students and practitioners.

100 LESSONS FOR UNDERSTANDING THE CITY

ANNE MIKOLEIT AND MORITZ PÜRCKHAUER
CAMBRIDGE, MA: MIT PRESS, 2011
ISBN 978-0-262-01651-4
HARDBOUND, 112 PAGES, ILLUSTRATED, BLACK AND WHITE, $18.95

Reading the city engages everyone, native and tourist alike. Because the city is dynamic based on weather, economics, time of day, multisensory stimulation, it is not just about parks, open space, or building configurations, or repurposing old structure or creating the new; it is about the changing affordances of the cityscape and how

this interacts with people's behavior. Some would argue that people's needs and behaviors should form the basis for the constructed city, others would argue this as too simplistic. This book supports an integration of people and environment; it takes a holistic view of the experience and reading of a city.

Based on observation and analysis of SoHo in New York City, the patterns the authors found can be either challenged or brought to other locations. Having lived in Hong Kong and suffered the suffocating heat and humidity of their summer, the book's first entry does not ring true: "People walk in the sunshine"—this may be true in northern cities during nine months of the year, but it is seldom true in southeast Asia; witness women walking with umbrellas open in the sun. In Hong Kong, shopkeepers open their doors to let expensive air-conditioning flow onto the sidewalk to lure customers in for a brief respite from the heat and perhaps to make a purchase. Shopkeepers are observant and use the allure of physical comfort as a strategy to gain attention and entrance.

In contrast, pattern 64, "Public squares and niches create positive outside spaces," holds true in Hong Kong. This entry runs counter to the quote cited from Christopher Alexander who observed that leftover spaces between buildings are generally not used. In Hong Kong on the Kowloon side, spaces between museums, or the space along Victoria Harbor are important destinations for domestic workers' Sunday picnics with friends, and for both local and tourist movement along the harbor. Because space is at such a premium in Hong Kong, streetscapes and buffers between buildings find spontaneous use, creating a positive and lively urban scene. The scale of a city and the density of its population can be determinants in the use of space; sometimes use just happens spontaneously based on these characteristics, and sometimes the space needs to be designed to draw people in.

The authors use quotes from earlier city observers such as Christopher Alexander, Jane Jacobs, Kevin Lynch and William Whyte to deepen the brief one hundred entries. A simple diagram or iconic rendering accompanies each entry along with a pithy statement of observed fact. Some entries have documentary photographs that flesh out the urban scene. The entries cannot be taken for granted; they must be examined and tried in a specific locale to check their legitimacy. The patterns

presented, drawn from one urban context, do not always translate to another as numerous, changeable variables define urban space and the human behaviors they elicit.

The entries are most useful as sample ways to observe, analyze and understand a cityscape or even a small town. Attending to human-environment interactions can reveal new opportunities that might easily be overlooked with a more traditional perspective. This book is designed to be picked-up and browsed as needed and to stimulate observation and thought regarding the built environment.

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Special thanks to Font Bureau for graciously providing both Miller Text and Miller Display for use in this issue of *Visible Language*.