

**Department of Design
Carnegie Mellon University**



Governing Ideas

Communication and the Human Experience in Design

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June, 1993

Introduction

This document was written to accompany the plan for a new undergraduate curriculum in the Department of Design. It presents some of the governing ideas behind the curriculum and the core of the department's *vision, mission, and operating values*. This is an expression of what we want to become over the period of the next five years, why we believe this is important, and how we intend to achieve our goals and objectives in the course of daily work.

The ideas contained in this document will be elaborated in other departmental documents as part of ongoing development efforts. Many are already expressed in articles, books, and public addresses by the faculty. Nonetheless, for the serious reader who wishes to understand the Department of Design and where it is headed, this document should serve as a useful beginning.

As background, the Department of Design began a major revision of its undergraduate program in 1990, based on a mutual decision taken by the Department of Art and the Department of Design no longer to participate in the previously shared foundation-year program. For the Department of Design, this decision reflected an emerging vision that seeks a balanced relationship among aesthetics and the fine arts, the social sciences, and engineering in a new integrative discipline of design thinking oriented towards the changing needs of the design professions and the advance of technology. In essence, the department seeks to preserve the rich visual and formal traditions of design while also seeking to connect design with the advance of knowledge in other areas, particularly the behavioral and social sciences, and advances in technology. This is a vision for a *university* design program suited to the culture and strengths of a leading research institution such as Carnegie Mellon University.

The new direction of the department is the result of an extended period of study and reflection that focused on three areas:

Governing ideas and vision of design operating in the department

State of design education in the United States and abroad

Strategic advantages afforded by Carnegie Mellon University

The following sections of this document present a summary of observations and conclusions reached in each area.

I. Governing Ideas

Although the Department of Design is located within the College of Fine Arts, the department does not regard design as a fine art in any traditional sense of "applied" or "commercial" art. Design is an art of *forethought* that precedes any art of making, doing, or knowing. It is an art that anticipates the symbols and images, physical objects, activities and services, and systems or environments that support human beings in accomplishing whatever purposes they set for themselves individually or in groups. These ideas lie behind an operational definition that serves as a central theme in the department: **Design is an art of conceiving and planning products that are useful in supporting the activities of human beings in all areas of experience.** Except in the area of crafts, designers do not make final products. They make prototypes and other visualizations, usually with supporting documentation, that subsequently serve to guide manufacture and production.

Scope of Design

The wide scope of this art is one of the central reasons that few unified theories of design have emerged to give coherence and understanding to the practical explorations of design in the twentieth century. The practice of design has been so diverse, with design thinking applied to so many subjects, that theorists have found it difficult to assimilate the wide range of products, and the activities needed to design those products within a single framework.

The breadth of design as it is understood and practiced today may be illustrated from two perspectives: dimensionality and product types.

From the perspective of dimensionality, design is concerned with two-, three-, and four-dimensional products and with systems and environments that transcend dimensionality or are *n*-dimensional. Designers work with the potentialities of surfaces, depth and volume, and time, as well as the integrations of all of these in environments. The range of dimensionality helps to explain why, in the changing environment of technology, designers are increasingly concerned with intangible as well as tangible products.

From the perspective of product types, design is distributed among graphic and communication design, industrial and product design, the design of activities and services, and the design of systems and environments such as found, for example, in engineering, architecture, and urban planning. Each of these areas may be further sub-divided into a remarkable array of specific product types, limited only by human imagination.

The wide scope of design applications is vividly reflected in the array of colleges, schools, and departments at Carnegie Mellon that are explicitly engaged in explorations of one or another aspect of design and, over the years, have made significant contributions to the understanding and practice of design. Examples of accomplishments at CMU constitute an impressive list, indicating why this institution can legitimately claim to have played a central role in the development of design in the twentieth century.

The first degree-granting program of Industrial Design in the world was established at the Carnegie Institute of Technology in 1934, simultaneous with the emergence of the profession of industrial design in the United States .

CMU, through the efforts of Herbert Simon and others, pioneered the fundamental reconstruction of design as a "science of the artificial"

CMU led efforts to reintroduce design into the engineering curriculum

CMU has been a leader in the development of artificial intelligence, software engineering, and robotics

The Department of English, through its programs in rhetoric and technical writing, pioneered the development of document design

The Department of Social and Decision Sciences has played a central role in the establishment of the science of decision making and the development of the management of information systems, both of which are significant for design

The Department of Design has offered pioneering courses in human-computer interface and interaction design

CMU, with the support of industry and the National Science Foundation, established the unique and highly innovative Engineering Design Research Center to promote the interdisciplinary investigation of new design tools and methods

The Department of Design, with the collaboration of the Graduate School of Industrial Administration and the Engineering Design Research Center, offered the first interdisciplinary course in the United States in *integrated product development*, which has served as a model for other institutions

This list gives only a partial indication of the extent to which design problems are explicitly addressed throughout this university. It overlooks contributions from the Department of Art in the work of Robert Lepper and others, the activities of the Department of Drama in set and costume design, the work of the Department of Psychology in many areas, the development of shape grammars and supporting computer-aided-design in the Department of Architecture, and the work of many other departments. But the fact that the scope of design applications continues to expand—evident at CMU in new areas such as interactive media, virtual reality systems, Artificial Intelligence (AI), Intelligence Amplification (IA), and so forth—explains why design can neither be confined to a single department nor adequately defined by specific product types or the narrowly circumscribed technical activities required to design a specific product type. In short, design is potentially universal in scope, applicable wherever human beings conceive of the possibility of a new product.

The implication for the Department of Design is that while the undergraduate program should focus on a selected range of design applications, it should also be broad-based, providing students with the fundamental skills and knowledge required to adapt to changing circumstances in communication design and industrial design, which are the central concern of faculty and students in the department. The department will continue to teach the essential core of graphic and industrial design, but supplement this with experiences that show how design may be applied in new ways. In particular, the department will seek connections with other departments at CMU that enable design students to explore new areas of design application in general and new applications of communication design and industrial design in particular.

Nature of Design

Despite the wide scope of design applications, the nature of the art of design has emerged with greater and greater clarity throughout the course of the twentieth century. More theoretical and empirical investigations are needed to consolidate and integrate the insights that have been gained, but enough is now understood to establish a sound platform for education and to reorient research in promising new directions.

This platform is based on two observations. First, the development of design in the twentieth century has progressed from a vision focused on the fine arts, to a vision focused on engineering and the natural sciences, to an emerging vision focused on the social sciences. The first and second visions are well represented among design schools in the United States and abroad. The third vision is a relatively recent development, based on the ideas of "user-centered" design and "user-friendly" products. No design school in the United States or abroad has yet based its program fundamentally on the relationship between design and the social sciences, but such a development may be anticipated. It is already foreshadowed in a small number of programs that emphasize design as a strategic planning activity for business or that emphasize design management and leadership.

However, the Department of Design believes that none of these visions are entirely adequate to the needs and responsibilities of designers in the contemporary world. Design cannot be reduced to fine art, engineering, or the social sciences **without a significant loss in the richness, value, and utility of products**. There may be strategic reasons for specialized work in one or another of these areas—e.g. engineering design—but designers draw knowledge and insight from all of these areas in order to conceive and plan effective products.

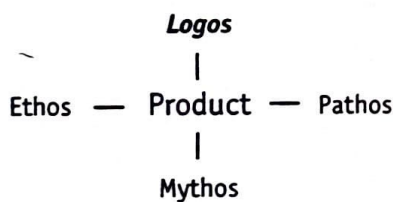
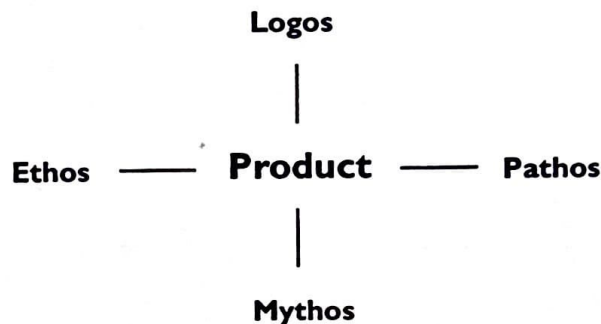
This leads to the second observation. While design in the twentieth century has formed strong alliances with each of the broad subject-matter disciplines—the fine arts, engineering and the natural sciences, and the social sciences—there has also been a parallel development of the distinctive concepts and methods of design as an integrative discipline, independent of specialized subject-matter disciplines. The vision behind this development is perhaps less evident than the visions that have reduced design successively to the fine arts, engineering, and the social sciences. But in the long term, the vision of design as an integrative discipline is more significant. Alliances between design and other disciplines will change from time to time as exciting new knowledge emerges in one or another field due to the contingent circumstances of research. But the essential advance of design—its ability to retain an identity and to incorporate new knowledge in the broader enterprise of design practice—will come from better understanding of the integrative nature of design thinking.

The implication of these two observations for the Department of Design is two-fold. First, the department should seek to develop the new relationship between design and the social sciences for the special insights that this can give into the nature of products in the contemporary world, without seeking to reduce design to a mere application of the knowledge and methodologies of the social sciences. This offers the possibility of opening new lines of research and new ways of thinking, without repeating the mistake of trying to reduce design to what it is not. Second, the department should seek to articulate and develop the concepts and methods of design as an integrative discipline, building on the most important traditions of design thinking in the twentieth century and advancing the core understanding of design as a distinct discipline.

This does not mean that the department seeks to abandon connections with the fine arts or engineering. Quite the opposite. We seek a balanced approach to design that fosters such connections and enables designers to make their own distinct contribution in collaborations with engineers and artists. Indeed, the balanced approach that the department advocates means that designers should be able to add distinctive value to the specialized and highly focused work of design engineers and collaborate more effectively with colleagues in the fine arts.

Content of the Art of Design

The approach taken by the Department of Design is based on the identification of four essential features or elements of all products, whether such products are instances of communication design, industrial design, or any other form of design. Using classic humanistic terminology, these elements are expressed in a simple paradigm or schematism.



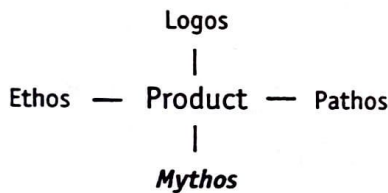
Logos is the core element. It is the logical or technological reasoning that forms the heart and soul of an effective product. In graphic and communication design, every image either contains an argument or serves the purpose of advancing an argument. For example, a poster is built around an argument that attempts to persuade viewers to attend an event or buy a product. A scientific illustration or a graphical display of information serves to advance the argument of an article or book by providing clear and visually persuasive data suited to a specific moment in the development of thought. In industrial design, every product—whether high-tech or low-tech—embodies mechanical or electronic principles and, thus, a chain of technological reasoning that supports functionality in the narrow and precise sense of effective operation. For example, a chair must be constructed to distribute and bear the weight of the person who sits. A domestic electrical device must be constructed to allow wiring and heat dissipation, with proper attention to insulating materials.

With regard to technological reasoning and other forms of logos, it is clear that subject-matter specialists usually play a critical role in determining the logic of a product. Indeed, the complexity of problems in advanced technology virtually requires a specific differentiation and specialization in engineering design. The same can also be said of software engineering design or any other area where knowledge must be obtained from the basic sciences and applied in product development—e.g. materials science--metallurgy, ceramics, and so forth.

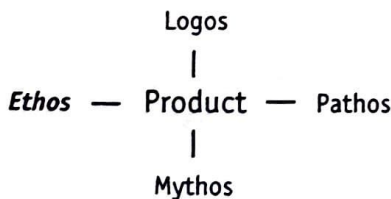
Designers who concentrate on technological reasoning face a double problem. First, they must provide integrative thinking to assimilate theoretical knowledge from the basic sciences and turn it into operationally effective knowledge—often through highly original syntheses or the discovery of active

principles and technical design methodologies. Second, they must help to build bridges to other types of designers who may contribute in other ways to the development of effective products. One of the most challenging areas of design theory, research, and education is to recognize and explore the rigorous requirements of engineering design *and* the need for design engineers and other types of designers to collaborate in probing the full range of design issues involved in product development. The practical implications for business and industry are immense and may well constitute one of the most important competitive advantages for companies and corporations in the future, as technological advances are shared across industrial sectors and individual companies differentiate themselves by how they organize for the exploitation of such advances in the development of concrete products.

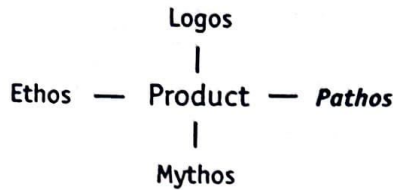
To understand the other elements surrounding the core element of logos, it is important to recognize that the functionality of products is not determined solely by logical or technological reasoning. Three other features of products serve to modify and supplement logos, creating a complex argument that is suited to human beings and the particularity of their psychological, social, and cultural circumstances.



Mythos is the narrative or scenario of product-use in concrete situations: the “plot-structure” facilitated by a product. It is the expression of logos in terms of human experience, described by Dewey as “having an experience” or “the structure of experience.” For example, a Xerox copier is more than a collection of mechanical and electronic operations. It is a machine adapted to certain types of work and work-related activities and, indeed, a machine that shapes such activities in accord, to some extent, with prior expectations. The machine contains within itself an embodiment of the anticipated situations of use, with a heavy loading of the mythic social and cultural meanings of various human activities. The study of mythos serves to temper and give greater understanding to the employment of logos in concrete situations. Indeed, the development of software design appears to be turning more and more to the concepts of plot, action, character (persona), and thought—terms derived from Aristotle’s *Poetics* and the tradition of rhetoric—to illuminate the human dimension of the logic embedded in software code in various application packages, whether for entertainment, education, or other practical applications.



Ethos is the quality of character and voice embodied in a product. It is an expression of the personality or character of the designer and of the manufacturer—or, how they wish to be perceived through their products. The significance of ethos is evident, for example, in the fact that human beings select products based to some extent on the kind of ethos with which they wish to identify. The ethos of an Apple computer contrasts sharply with the ethos of an IBM personal computer—evident, for example, in the nature of the interface. Similarly, the ethos of institutional office furniture contrasts sharply with the ethos of domestic furniture. When one uses the phrase “intelligent products,” the reference is not only to the logic embedded in integrated circuitry but to the ethos of human intelligence carried in such products. Style and artistic expression are often associated with ethos, although ethos also provides a useful way of identifying the ethical and spiritual qualities evident, for example, in Shaker furniture. Qualities of ethos are extremely varied in the contemporary world, and they can be exceptionally blatant or exceptionally subtle. In either case, ethos is a major determinate in the acceptability and effectiveness of all products.



Pathos is a term for the physical and psychological qualities—the feelings and emotions—engendered in the human beings who employ a product. Pathos is the traditional domain of human factors analysis and ergonomics, progressively augmented with knowledge gained from the cognitive sciences and the social and cultural sciences. However, unlike anthropologists and sociologists, who contribute significant understanding of mythos and ethos but generally decline to describe themselves as designers, cognitive psychologists and social psychologists in recent years appear much more willing to describe themselves as designers. It remains to be seen which of these two groups of social scientists takes the wiser position in this matter. It seems evident that the concept of pathos contains more than is circumscribed in the domain of cognitive psychology. The old alliance between design and the fine arts remains vital for exploring aspects of pathos that are not grasped by scientific analysis.

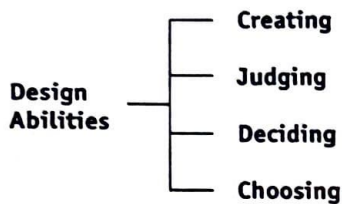
Why should there be a balance among these elements? First, their combined presence is unavoidable. The four elements are interconnected and interdependent; one cannot exist without the others. The qualities associated with each element will emerge either by accident (with potentially disastrous consequences for product acceptance) or through deliberate planning and design. Second, if any one of these features dominates product development, the result is often a distortion which may or may not serve the needs of human beings. For example, excessive emphasis on logos may lead to clumsy products. Excessive emphasis on mythos may lead to nostalgic products and awkward, comic combinations of innovation and tradition. Excessive emphasis on ethos may lead to shallow and ineffective products. Excessive emphasis on pathos may lead to dull, boring products that lack elegance and spirit.

**Form of the Art
of Design**

The department's approach to design is fundamentally **rhetorical** in nature, in the sense that we regard design as a discipline that is based on the "situatedness" of products. This is a recognition that all products are situated in concrete, particular circumstances of human use, and that design must be a communicative art directed towards planning and shaping human experience. The task of the designer is to conceive and plan products that are appropriate to human situations, drawing whatever knowledge and ideas are needed from all of the arts and sciences. For this reason, we have identified **communication and the human experience in design** as the fundamental theme of the department.

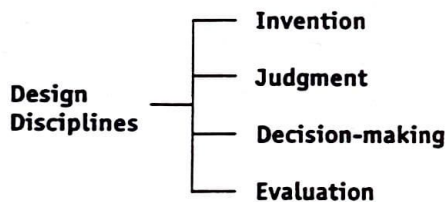
The need for an integrating discipline of design comes precisely from the necessity of integrating many critical features in order to create products that are appropriately situated in the human community. Design is an art of practical deliberation oriented towards shaping the argument of all products. The core of design, therefore, is an argument that integrates logos, mythos, ethos, and pathos. This argument is not expressed in words, except to the extent that designers may describe their product-ideas to clients in proposals or supporting documentation. Fundamentally, the expression is in concrete materials and sensory qualities of line, color, shape, volume, space, and time. The arguments of designers are vividly embodied in images, objects, or structured activities. The non-verbal quality of the designer's work is perhaps why design continues to receive so little attention among many traditional academics and scholars, who may believe the world is dominated by verbal culture.

Although there are many tactical skills and techniques required of designers—the ability to draw, use computers, make effective presentations to clients, and so forth—the department believes that there are four strategic disciplines required for the conception and planning of effective products. The gradual development of these disciplines constitutes one of the central traditions of design thinking in the twentieth century.



A proper historical account of the development of this tradition is not possible in a short space, but one moment in the development may serve to illustrate the foundation on which the Department of Design seeks to build. In *The Sciences of the Artificial*, one of the foremost works of design theory in the twentieth century, Herbert Simon identifies the disciplines of design thinking in their psychological form as *abilities* that enable individuals to move among the subject-matter disciplines and cross the cultural boundaries of specialization. "The real subjects of the new intellectual free trade among the many cultures are our own thought processes, our processes of judging, deciding, choosing, and creating."

We believe this is a concise expression of the new rhetorical approach to design, an approach that is particularly appropriate in an age of technology. In the context of Simon's work, it leads to better understanding of the "sciences of the artificial," with all of the meaning this phrase expresses for his approach to philosophy and science. But, with rearrangement and explicit identification of correspondences with the traditional arts of rhetoric, the *disciplines* of design empirically observed by Simon also may be characterized as: **invention, judgment, decision-making, and evaluation**. In practical terms, the disciplines are formal *enablers* of human ability.



1. Designers must be **inventive** in conceiving the possibilities of a product.
2. Designers must be able to **judge** which of their inventions are viable in the contingent circumstances of manufacture and human use.
3. Designers must be able to make connections among many fields of knowledge essential for the development of a product and, based on such connections, draw reasonable conclusions or **make decisions** about the plan of a product.
4. Designers must be able to **evaluate** the results of conception and planning and choose a final solution based on values, preferences, and goals before a product is carried forward to clients and, ultimately, to human users.

While the psychological form of these abilities deserves close attention, the department is particularly interested in their form as *disciplines of thinking and acting*. We believe that the psychological abilities identified here may be formalized as methods or arts, in the same way that the ability to speak persuasively has been formalized in the intellectual and practical art of rhetoric. The purpose of such formalization is to better teach design. It is true that some designers practice by natural genius, while others learn to practice by following the example of good designers. But most designers learn to practice by acquiring a grasp of the fundamental principles of design—whether those principles are well or poorly understood in the schools. Indeed, one of the central purposes and justifications of a university-based design program is to advance the understanding of such principles as the basis of a systematic discipline.

The development of this integrative model in departmental research and in undergraduate and graduate programs will, we believe, serve to identify the Department of Design at Carnegie Mellon as a leader in design theory and professional design education. It constitutes a new vision of design that contrasts with visions that are grounded in subject-matter disciplines such as the fine arts, natural sciences, or social sciences.

***Design in Practice:
Styles of Designing***

Does this model of design recognize and encourage diversity in the actual practice of designing? How does it support a pluralism of approaches among designers and design educators?

The model identified here is not a body of rules. It does not prescribe a particular way of designing. Instead, it provides a framework for identifying and discussing issues in the practice of designing and a principled way of characterizing the work of individual designers.

For example, does design occur in the head or in the hand? Is designing intuitive or rational? Does it begin with materials and the techniques of shaping materials or does it begin with an idea or a dream? The answers depend on the individual designer. There are many successful styles of designing--ultimately, perhaps as many styles as individual designers. What the rhetorical model provides is a sensible way of identifying the issues that unite or divide individuals, allowing conversation to move forward through a sharing of insights achieved or a clear identification of issues of fundamental difference. In other words, there may be a formal art or discipline of design that the rhetorical model approximates, but this art is expressed and employed in many different ways in the actual practice of designing, depending on the personal abilities, beliefs, and interests of individuals. The rhetorical model provides a useful way of understanding the pluralism of design practice and, at the same time, encouraging the exploration of different approaches.

The department is stronger for the diversity of approaches or styles of designing taken by the faculty--even if the differences are, at times, seemingly incompatible or irreconcilable. And for this reason, the department also seeks to cultivate the individual visions, voices, or styles of its students without imposing a single style or approach to which all students must adhere.

Therefore, this document cannot be complete as an expression of the governing ideas of the Department of Design without supporting expressions of the approach taken by each member of the faculty. The development of such expressions remains a challenge and a responsibility of the faculty as we attempt to build a community.

Purpose of Design

As conceived by designers, the purposes of design are exceptionally diverse. Some designers pursue what is **good** for human beings and for society at large. Others pursue what is **useful** in supporting human activities and the quality of human interaction. Others pursue what is **pleasurable and delightful** in easing the burdens of everyday life. And, still others pursue what is **just or fair** in the distribution of products and services across all sectors of society.

All of these are reasonable goals and provide a basis for understanding the integrity of design, designers, and products. A department of design should not attempt to serve as an arbitrator among the diverse purposes conceived by designers for their art. Rather, it should be a place for discussing the practical consequences when one or another purpose guides designing.

However, behind this idea lies a vision of cultural unity and individual diversity that we believe is fundamental for design in the contemporary world. We value **objectivity and responsibility** in the honest assessment of the contributions of design to everyday life, and we value **pluralism** in the approaches taken by designers. We oppose the twin dangers that have created so many conflicts in the twentieth century: dogmatism and anti-intellectual relativism—both based on a belief that one person or one group possesses the truth and that there is no need for discussion and debate in an ongoing search for truth and knowledge.

Applied in the context of the Department of Design, this means that the “governing ideas” expressed in this document provide only thematic focus for continuing discussion. They are only a framework for vigorous debate based on different individual views of the nature of design.

Whether these values are successfully transmitted to our students, they are operational in the department. We seek to build an environment that expresses the principles of the “learning organization,” sometimes known as the “knowledge organization”:

More horizontal than vertical in organization, recognizing that there are many knowledge-zones in which different faculty members possess expertise and that formal leaders do not possess all of the knowledge required to make an effective organization

Commitment to quality and continuous improvement

Commitment to individual empowerment through distributed leadership and shared decision-making

These are important values that guide the department. But we also recognize that they are values increasingly promoted in the corporate environment, where “Total Quality Management,” continuous improvement, and recognition of the importance of the user or customer in determining quality are becoming more evident. The terminology may change, but the movement in this direction is more than a fad. It is a movement that is quintessentially *design-oriented*.

We believe that by building a departmental environment around these operating values—and teaching the specific concepts and techniques associated with movements such as TQM and the knowledge organization—our graduates will be better prepared to adjust to, and help to shape, the new culture of business and industry.

II. State of Design Education

In assessing the current state of design education in the United States and abroad, the department focused on three issues that are particularly relevant to the direction of our program. These are related to the *what, how, and why* of design education.

First Issue: Content & Method

Many design schools in the United States and abroad are guided by a vision focused on either the fine arts or engineering. Those schools focused on the fine arts tend to teach design as an intuitive process grounded in aesthetics and personal expression, sometimes emphasizing presentation skills and styles of expression above the substance of logic in design thinking. In contrast, schools focused on engineering tend to teach design as a rational science or an extension of the work of mechanical or electrical engineers, emphasizing analytical methods and sometimes neglecting issues of ethos and mythos, or even pathos. Both types of schools have, of necessity, tempered their approach with work in human factors and ergonomics. But no school has yet exploited the full potential of the social sciences to shape a competing vision of design and design education.

Between these extremes there are many design schools with no distinctive intellectual identity but occasionally recognized for accomplishments in one or another specific area of design application or product type, often based on the work of one or two faculty members.

The pluralistic array of design schools is valuable, and the diversity of approaches represented among these schools and their faculty members is certainly valid for facing the complexity of design in the twentieth century. But the pattern of variation among these schools also suggests that there is a deep ambiguity in the content or subject matter of design and in the methods of design thinking and design education.

Uncertainty over the content and method of design education points toward a fundamental unresolved problem that no school has adequately addressed in theory or practice. Can designers in the 1990s afford to view themselves as specialists in one or another of the traditional subject matters with which design has been affiliated in the twentieth century? Or, must designers demonstrate an ability to work with others to integrate knowledge in ways that are most productive for the design professions?

Second Issue: Skills & the Formation of Intellectual Character

Most design schools continue to teach design in the manner of trade schools. Students receive instruction in narrow, specialized skills suited, at best, to current practices and technology or, at worst, to past practices and old technology. Little attention is given to the formation of the intellectual character of designers or to the acquisition of integrative disciplines of design thinking that would enable students to adapt to changing circumstances and lead the development of the design professions.

It is essential for students to acquire the basic skills needed for entry-level positions in the design professions. However, to teach skills alone is a trade school activity that does not serve the long-term interest of students or the design professions. It is the responsibility of design educators to help form the intellectual character of students so that they may become future leaders.

This is particularly the responsibility and capability of university design programs, where the resources of a broad and diverse institution are available. A university design program, in contrast to a trade school program, should

focus on individual growth. It should help students acquire basic skills and, at the same time, develop personal understanding of the reasoning and principles behind those skills. Given the nature and ability of students who are attracted to university design programs, it seems essential that design education provide a rich and diverse, intellectually stimulating experience that recognizes the long-term potential of intelligent students to shape the professions. This means committing a significant part of the curriculum to general education in the liberal arts and sciences and seeking to increase the level of intellectual challenge in design courses, with more attention to the intellectual and cultural roots of design and the place of design in contemporary business and society.

The key to success in this venture is to avoid excessive emphasis on theory, detached from practical experience. Otherwise, design departments will drift into the pattern of traditional academic disciplines, where practical matters are often significantly undervalued, if not disdained. If design has a place at all in the universities, it is not because of a concern for either theory or practice in isolation. A design program is valuable in a university because it serves as a concrete example of how to combine theory and practice for productive purposes.

***Third Issue:
Leadership***

It is a common observation that design schools tend to follow behind design practice rather than lead. Only a few schools have begun to assert the idea that design education can and should lead the design professions through innovative research and new kinds of instruction.

This stands in sharp contrast to the accomplishments of professional education in areas such as architecture, engineering, medicine, and business, where graduates are now expected to bring new ideas and methods as well as ready hands to the tasks of professional work. Study in these professional programs is expected before graduates assert their leadership in the workplace.

One factor in the tendency of design education to lag behind design practice is the disarray of design theory and the lack of a pluralism of coherent, competing frameworks for approaching design problems. Individual faculty members hold personal visions about the nature of design, but there is little vigor and sophistication in generating productive debates that might create a distinctive direction for program development. This situation seems to be marginally worse among industrial design programs than among graphic and communication design programs.

The best design programs appear to be those which combine excellence in practical education with vigorous debate about the central issues of design in the contemporary world. Such programs, few as they are, attract professional designers and corporate involvement because the environment is exciting and challenging, with the potential of adding value to every interaction.

We believe that a department of design should be a place where professional designers come to test their ideas—have them challenged and developed—rather merely to present a portfolio, as if selling to a client. What should distinguish a university design program from a trade school program is a concern for the reasons and principles behind design practice. The cultivation of such a concern will make design education at least an equal partner with the design professions.

III. Strategic Advantages for Design at Carnegie Mellon

Carnegie Mellon University provides a uniquely friendly environment for design that has made this institution a leader in design thinking and its graduates leaders in the design professions. This environment is based on a clear institutional focus on practical problem-solving, recognition of the close relationship between theory and practice, and special commitment to the development of new technologies. Many of us believe this makes Carnegie Mellon a model for a new kind of university that will arise in the next century and change the direction of higher education in many ways.

One logical and natural consequence of the special environment at Carnegie Mellon is that design is a pervasive theme throughout the institution, discussed and debated from a wide variety of intellectual and disciplinary perspectives—and always with practical implications foremost in everyone's mind. We have already observed the extent to which design is an explicit subject of attention in many colleges, schools, and departments at CMU. There is probably no institution in the United States or abroad where this is more the case.

In addition, the excellence and diversity of intellectual resources at Carnegie Mellon fosters a tradition of interdisciplinary cooperation that has enabled faculty and students to combine ideas and methods from many fields in order to address practical issues in highly innovative ways.

For these reasons, the Department of Design has an opportunity to draw substantively on the work of colleagues in more disciplines than design departments at other institutions, where a narrower focus (e.g. the fine arts or engineering) or "multi-versity" size makes such connections more difficult or impossible.

Such an environment helps to explain why many of the central themes of design, design theory, and design education in the twentieth century have been debated and explored at Carnegie Mellon, enabling faculty and students to advance innovative ideas that have helped to shape the course of discussion elsewhere. Some of the most intense discussions have formed around the relationships among design and the fine arts, design and industry, design and engineering, design and the liberal arts, design and the social sciences, and, most recently, design, rhetoric, and technology. Debate on these issues continues, forming the intellectual background of the Department of Design.

In summary, these are some of the primary strategic advantages afforded by Carnegie Mellon for the development of the programs of the Department of Design:

Clear institutional focus on practical problems, the close relationship between theory and practice, and the development of new technologies

Excellence and diversity of intellectual resources

Strong tradition of interdisciplinary cooperation

Conclusion

Every design program is strongly influenced by the culture of the institution in which it is located. The Department of Design at Carnegie Mellon is no exception. Yet, the department also seeks to influence its surrounding institutional culture by advancing ideas about design that may be useful to others. By focusing on design as an integrative discipline and exploring the relationships among design and the social sciences, the department can help to humanize technological development elsewhere in the university. In this regard, we believe it is a strategic advantage for the department to be located in the College of Fine Arts, not because we advocate a vision of design focused solely on the fine arts, but because aesthetic considerations are also part of the humanizing of design and technology that we seek. The College of Fine Arts remains a hospitable home for a department that seeks to collaborate with but not be dominated by strong friends.

It is obvious that design is not the possession of any single department at Carnegie Mellon. But the Department of Design can play an important role in stimulating debate and offering a place where faculty from other departments can pursue research questions and further develop the concrete application of their ideas in real products of communication design and industrial design. Furthermore, the department can provide a connection with the professional design community in consultancies, corporations, and not-for-profit institutions that can prove vital for the work of the university.

Selected Bibliography

From time to time friends of the Department of Design have asked what books and articles have influenced the approach to design and the relationships among design education, professional practice, and the university represented in this document. We hesitate to cite particular works in design literature because the influences are so diverse and, as pluralists, we see our approach as both a unique departure in the design community and one that is thoroughly grounded in a variety of traditions. However, there are several books and articles whose influence may be traced in our understanding of the broader relationships of practical education in a university environment. It is no accident that many of these works are in the strong tradition of American pragmatic philosophy nor that some of them represent trends in dialectical and empirical philosophy. They are all explorations of the liberal arts in a technological age.

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