The Future of Design Education Initiative Overview

Design Education Today: The Challenges 3
History of the Initiative 3
Structure of the Initiative 4
Principles 4-5
Act at the Appropriate Scale
Anticipate the Future
Restore and Sustain Ecological Balance
Focus on People
Reconcile Competing Priorities
Strive for Inclusivity
Respect the Importance of Place and Culture
Accept Accountability
A Code of Ethics
Themes and Topics 5
Three Categories of Themes and Topics: Core, Specialized, Elective 6
Core
Specialized
Elective
Levels of Learning mastery: Familiarity, Usage, Reflection
Themes 7-8
Representational Approaches
Systems Thinking
Implications of New Technologies
Tools, Materials, and Technologies
Organizational Processes
Product and Service Development
Methods
Community Engagement: Designing with, not for
Culture
Forecasting and Foresighting
Measurement and Evaluation
Design History
Teaching Basic Research
Social and Human Behavior
Knowledge Shared by Design Disciplines 9
Human-Centered Design (HCD)
Cultural Diversity
The Environment
Multidisciplinarity
Ethics
Themes Defined by the Teaching Context 10
Primary and Secondary School Design Education
Certificate, Boot Camp, and Non-degree Design Programs.
Internships, Cooperative Education, and Sponsored Projects
Types of Institutions
Accreditation
Cultural Representation

Student Characteristics
Characteristics of Incoming Students
Characteristics of Graduating Students
Professional and Ethical Responsibility
Commitment to Life-Long Learning

Pedagogical Principles
Design Education Beyond the Classroom
Social and Evaluative Pedagogical Practices
Principles from Learning Science

Phase 2 of the Initiative
Working Groups (WGs)
Publishing essays
Intellectual property

Note to Readers
This Overview covers the Initiatives of the Future of Design Education as of the end of calendar year 2020. Each section is deliberately kept as short as possible while still covering the content and method of approach of the activity being described.

We do this to keep this Overview short enough for comfortable reading. The individual working Groups will have detailed descriptions to structure their work and determine what goes into the final published document (probably in the year 2022 or 2023).
Design Education Today: The Challenges

The vast majority of college design programs still focus on the surface appearance of artifacts, despite declining employment in this type of practice. These conditions triggered this initiative to rethink design education for the 21st century. One priority of the initiative is to provide an in-depth, evidence-driven academic foundation for human-centered design decisions. A second priority is to help designers to become advocates for social and environmental responsibility.

Design education faces significant challenges. Designers today are often asked to address new kinds of problems at scales quite different from those of the past. Increasingly, design problems focus less on discrete artifacts for communication and manufacture and more on a diverse range of designed processes, services, systems, and communities. Some designers address complex sociotechnical systems that range from issues within local communities to multinational issues, such as the United Nations list of 17 sustainable development goals. As the power of design receives greater attention from industry, government, and society, many new opportunities emerge. Designers need a different kind of education to be able to address these issues.

References


History of the Initiative

The Future of Design Education initiative was conceived and founded in late 2019 by a partnership between the Design Lab of the University of California, San Diego, and IBM’s Global Design Group. The World Design Organization joined as a co-sponsor. An intensive consensus-building process has resulted in a small executive team, a Steering Committee composed of leading designers from academia and industry, and more than 600 volunteers ranging from undergraduate students to distinguished deans, department chairs, and industry executives representing every region of the world. These volunteers populate our working groups and provide overall assessment and advice in the content development process.

Creating curricular suggestions for a field as large and varied as design is a considerable challenge. To guide us, we restrict the kind of design we are addressing. We have sought guidance from other disciplines that have engaged in similar efforts with similar wide-ranging institutions, professional and academic practices, and multiple sub-disciplinary specialties.

This initiative focuses on design practice components that impact people, communities, and society. We call this Human-Centered Design. We do not address fields that do not directly interact with people. For example, engineering design usually emphasizes materials, structures, or programming algorithms with little concern for the impact on people. While this is often appropriate for the work they do, most of Engineering Design does not fall within the scope of this initiative. But we are relevant to most educational programs called “Design.”

For advice, we considered several disciplines (business, law, medicine). We ended up using the procedures followed by computer science, which has institutional variety and other needs similar to design. Computer science developed an efficient organizational structure and process for doing a thorough review of its curricula, making sure that it was appropriate to all kinds of educational institutions from two-year training through the multiple years of coursework of
major research universities of the world. They considered instructional practices for two-year technical degrees, three- or four-year undergraduate education, and graduate education, including terminal professional master’s degrees and PhD programs for those who wish to work in universities or research. Therefore, the Future of Design Education initiative adopted the computer science structure and procedures and expects to follow its time frame of ten-year reviews. Each takes roughly three years.

Just as Computer Science made sure that the recommendations were appropriate to a broad range of educational institutions, we intend to produce content and pedagogical suggestions which different kinds of institutions can use in whatever manner is useful and appropriate for the institution’s goals and resources.

Reference


Structure of the Initiative

This report summarizes the findings of sub-committees of the Steering Committee on four issues:

1. Principles underpinning work in design;
2. Themes of knowledge;
3. Characteristics of incoming and graduating students;
4. Pedagogical and curricular principles.

The eventual curricular guidelines will consider the wide range of themes within all the different sub-disciplines of design and divide them into three categories: Core, Specialized, and Electives.

Principles

Principles guide situational decision-making in practice:

Act at the Appropriate Scale
Designers need to distinguish root causes from symptoms and recommend or take action at levels most likely to produce positive outcomes. Some design problems are small while others are apt to require efforts outside designers’ usual roles with community decision-makers, local businesses, and politicians. For example, the design of a new home appliance is small, even though it involves several disciplines, whereas developing a sanitation system for a village is a complex sociotechnical systems-level problem that requires collaboration with professionals such as civil engineers, public health experts, economists, community leaders, and politicians.

Anticipate the Future
Designers need to identify forces of change and the emergence of effects over time. An intention to change human, organizational, or societal behavior must consider both the positive impact of proposed work and the potential negatives. Long-range planning should evaluate benefits in terms of consumer wellbeing, worker prosperity, and environmental responsibility.

Restore and Sustain Ecological Balance
Designers need to consider interdependent relationships between human activity and environmental systems, redressing negative impacts, and contributing to a healthy biosphere. Overarching design goals include ecological balance and redemption that reverses the 20th century’s human planetary impact.
Focus on People
The capabilities, needs, and behaviors of people and societal groups are always primary considerations for human-centered design. The impact should be optimized for the benefit of those affected: users, employees, owners, and even bystanders.

Reconcile Competing Priorities
Different stakeholders often have different points of view and different perspectives upon the many different dimensions of the issue being addressed. Acknowledging these differences and negotiating agreement on equitable solutions is one of the new skills required of designers.

Strive for Inclusivity
Designers need to pursue a diverse and equitable community of practice that includes the voices of all affected by its consequences.

Respect the Importance of Place and Culture
Historically, design has been practiced as a kind of monoculture, with design communities all over the world trained in and following the procedures and philosophies established within Europe and North America. There is an increasing demand for design to change its practices in order to build upon existing social structures and beliefs, including those of indigenous people, citizens in the economically developing regions of the world, and groups that experience discrimination.

Accept Accountability
Designers need to measure success in terms of technological feasibility, economic viability, organizational scalability, environmental sustainability, cultural sensitivity, physical accessibility, social equity, and ethical responsibility.

A Code of Ethics
The design profession needs a code of ethics that extends beyond the obvious characteristics of honesty, openness, effectiveness, and safety. Today, ethical design must take into account an understanding of and responsibility for its context, consequences, power, and privilege. The work must acknowledge the interdependency of social, cultural, physical, technological, and economic systems, respect the beliefs and privacy of individuals, and avoid damage to the biosphere.

Themes and Topics
Themes are subject matter categories that guide core topics and institution-specific structures for their delivery. Topics are particular content areas within themes. Thus, a theme such as Representational Approaches might contain topics such as Computational Models and Multidimensional Scaling. Themes:

- Are likely to remain relevant for periods measured in decades.
- Cover existing and foreseeable sub-divisions of design activity.
- Have the potential to serve as pedagogical scaffolding to aid learning from introduction through advanced understanding.
- May include traditional design content — for example, studies of materials and form, artifacts, or design history — but recast to fit the contemporary context for practice.
Three Categories of Themes and Topics: Core, Specialized, Elective

Some themes and topics are fundamental for all design disciplines (Core), while others are more advanced and extend knowledge under specialized or elective study (Specialized). A third group of topics (Elective) are optional, providing flexibility for students.

The initiative’s working groups will structure each theme into core topics that every program should teach, specialized topics that address advanced, elective, or disciplinary-specific content, and learning outcomes that describe what students should know and be able to do as a result of instruction.

The material and depth of coverage of courses within any theme, whether core, specialized or elective, will vary with the institution’s type to fit the students’ background.

- **Core** — Core themes and topics contain general knowledge that every designer should know; that every program must teach and require as understanding of the foundational concepts of design.

- **Specialized** — Specialized topics are built from Core topics at a more advanced or disciplinary-specific level. They are not part of the core curriculum but are required by the student’s sub-discipline.

- **Elective** — Electives are optional topics that allow students to expand their knowledge.

**Student Learning Outcomes** describe what students should know and be able to do with respect to each topic, and should include the level of mastery expected by students.

**Levels of Learning mastery** — Topics can be learned at three different levels of mastery:

1. **Familiarity**: The student understands the concept and what it means.
2. **Usage**: The student can apply the familiar concept, often in a context other than in which it was taught.
3. **Reflection**: The student can demonstrate appropriate usage and the ability to answer why a particular approach was selected from among alternatives.

Different institutions might require different levels of study and performance. Thus, for any given topic, a 2-year school might only require familiarity, a traditional design curriculum might expect mastery of usage, and a research university might expect reflection.
Themes

The Steering Committee and working groups together determine the lists of themes and their constituent topics, and designate which themes and topics are core, specialized, and elective. At the start of this process (in December 2020), over twenty themes were identified, listed, and described below:

Representational Approaches
Applications range across the design process, from exploring and framing problems, negotiating possible actions, and communicating outcomes to others. New forms of dynamic and interactive representations and those involving a variety of technologies and sensory modalities should be included (for example, augmented, virtual, and mixed reality).

Systems Thinking
Problems as interconnected elements, people, and activities organized in ways that produce patterns of behavior over time. Design increasingly takes action at the level of networks, systems, platforms, and communities. Systems thinking links structure to behavior in the pursuit of goals.

Implications of New Technologies
Novel technologies such as materials, sensors and actuators, smart products, big data, biological and electronic control mechanisms, pervasive communication, and artificial intelligence already impact design practice and production methods. New technologies enhance human sensory, physical, and intellectual capabilities. These innovations alter how we work, learn, and play, but with ethical challenges and biases.

Tools, Materials, and Technologies
There are multiple trade-offs in the choices of traditional and new tools, materials, and methods, so designers must understand inherent characteristics. Some tools will radically alter the work of designers. This theme addresses how we train designers to master new methods and ideas, thus enhancing their abilities (as opposed to allowing technology to replace the need for designers).

Organizational Processes
There are transformative processes, enablers, and cultures through which organizations achieve goals. Questions arise concerning the structural levels and components through which design can intervene. Under this theme, there are two major concerns: how organizations operate within existing governing structures and limitations and how new organizational structures respond to changing contexts and stakeholder goals.

Product and Service Development
The process of developing and implementing products and services, including software, has changed. More and more products and services must adopt a systems perspective, from initial design to product reuse or recycling, with special concern for methods and materials that could harm the environment (while also helping the company maintain profitability). This requires designers to understand competitive and strategic goals in order to create entirely new processes, policies, guidelines, and principles that differ from those that currently exist.

Methods
Design methods at all stages of the design process are critical for successful results. Designers must understand how each method contributes to the eventual outcome, standards of evidence, and ethical considerations that guide practice.

Community Engagement: Designing with, not for
Communities often have members who deeply understand the issues they face and who have creative, viable ideas. There are ways designers can work with communities so that the result is designed with them (as opposed to designed for them): a modification of co- and participatory-design.
Culture
Contemporary viewpoints assert that the cultural context of design is plural, participatory, and distributed. People are always immersed in space-specific networks of interactions that result from their social and cultural histories. The imposition of artifacts and systems designed by Western practices can disrupt design of cultures that have aspirations to be defined by their values, beliefs, and ways of being.

Foresighting
All designs have the goal to change or enhance human or societal behavior, but by anticipating consequences when the future is unknowable. Forecasting and foresighting are two methods for preparing for future events. Forecasting predicts the likely future while foresighting anticipates trends and forces that could produce multiple futures. Designers will need both tools, often using planning strategies and scenarios.

Measurement and Evaluation
Measuring and monitoring the short- and long-term impact of all the critical components of design and final implementation is a challenge and critical to ensuring continual improvements in design. This theme addresses how we collect relevant, trustworthy evidence of our work’s short- and long-term impact. Not everything that matters in design can be measured, and even when measurement is possible because design deals with people and society, many techniques fall prey to subtle biases. Moreover, the measurements are often noisy, probabilistic, and unstable. Designers have to understand data analytics while working with data science professionals. And important information is often qualitative, coming from observations, videos, interviews, and stories. These are important issues for which we need answers.

Design Histories
Design has its origins as a tool of industrialism, which has led to major social, cultural, political, geographical, technological, and economic forces that shaped 20th and 21st centuries. We study history to guide the future, so this theme needs to include precedents and cultures outside of the industrialized nations and cover design’s expansion beyond products and services into complex systems and the ability to address major societal problems. Design history shows that ignoring social and environmental impact has led to today’s critical conditions that require immediate attention.

Teaching Basic Research
This theme addresses the research community in academia and industry that works to uncover new design knowledge and theory, including research methods and standards of evidence comparable in rigor to those of more established fields. This theme considers how to organize, direct, and supervise evidence-based PhD programs, as well as training new design researchers. It should not be confused with reflecting on one’s own design work, library retrieval, or the field research that aims to understand customer needs in order to enhance product and services. Basic research contributes to advancing empirical and theoretical foundations of the discipline.

Social and Human Behavior
Models of interactions among people, organizations, and technologies by individuals and groups are essential to a Human-Centered design approach. Designers need to know about people’s sensory abilities and limitations, differences between conscious and unconscious actions, the importance of emotion, and limits of rational thought as a model for human behavior. Similarly, knowledge of group and organizational behavior (often studied in business schools and in the military academies) are essential. Applications of this knowledge range from the safety features of products to the interactive qualities of digital tools that support user creativity and resilience. Because design is an applied field, the models used by researchers are often unnecessarily detailed for our use: we care about major effects, not the subtle ones so necessary for the research theorist.
Knowledge Shared by Design Disciplines

Some areas of knowledge are considered so fundamental to the education of the modern designer that they rise above the level of specific principles, themes, and courses and should be incorporated into all areas of instruction as a fundamental part of the education. They should not be given in isolated courses or lectures: they need to be integrated into the entire framework of all design instruction and activities. We have identified five such areas:

1. Human-Centered Design
2. Cultural Diversity
3. The Environment
4. Multidisciplinarity
5. Ethics

Human-Centered Design (HCD)

We identify four major four tenets of HCD: 1) a focus upon people and society; 2) addressing the core problems, not symptoms; 3) treating everything as a system; and 4) rapidly and iteratively testing and refining ideas upon people representative of those for whom the work is being done and in situations as close to the intended ones as possible.

Cultural Diversity

Historically, design has been viewed through the lenses of the twentieth-century rise of industrialization and its approach to modernism. While rich design traditions exist in many cultures across the globe, the field at large fails to fully acknowledge diverse approaches, story archs, and applications. We welcome and shine light on different ideologies and approaches to practice that share a common concern for the human condition, and celebrate the unique contributions to a collective creative consciousness.

The Environment

A complete system, life-cycle design approach considers the environmental impact of extracting, processing, and disposing of material in the design, production, and use of products. It advocates an end of product life that imitates nature’s recycling of waste and returning things to the earth in a safe, non-toxic way. While this suggests technical expertise in materials and manufacturing, it also addresses the status afforded to objects and patterns of their use in society, which cause some populations to have disproportionately adverse effects on the planet. Changing the manufacturing cycle entails a major change in the business model of a company, so the aspiring designer who wishes to make a difference must also make the argument through costs and savings that accrue to the business.

Multidisciplinarity

Challenges defined by interacting elements and systems call for teamwork among experts from diverse fields. Designers need to work in, and often lead, smooth running teams who differ in their modes of inquiry, language, and points of view on common goals. Designers must be able to bring their strengths in design to multidisciplinary contexts where many of the other disciplines have little understanding of or appreciation for the role of design.

Ethics

The articulation of ethics in design is uneven and incomplete. While a number of professional associations have documents that outline standards of fair practice and legal statutes concerning employment and the use of work, few have assessed a rapidly evolving practice with wide reaching potential to do harm, or have considered the needs of different cultures and belief systems.

The long-term impact of design on social, cultural, and environmental systems is increasingly important. Some of these consequences were hidden when designers primarily produced relatively small, self-contained items, but when these are mass-produced by the millions or hundred of millions (as in a cell phone or computer tablet) the total impact upon the world’s peoples, economies, and the environment is huge. Design has unwittingly
participated in today’s unequal access to tools and information, loss of privacy or agency, and business models that emphasize short-term profit over human well-being. We need a new, more inclusive code of ethics.

Themes Defined by the Teaching Context

Some design education occurs outside of college classrooms. Instruction is defined by context, rather than content competencies. These issues deserve attention through additional working groups and include:

Primary and Secondary School Design Education
How design might be taught in primary and secondary education is not the focus for this initiative, but as major studies call for creative problem-solving as a 21st century skill, it is important to consider how design can assist in achieving this goal. A second reason for this concern is that design graduates may engage with primary and secondary schools as teachers or volunteers.

Certificate, Boot Camp, and Non-degree Design Programs
Many students do not wish to get a formal degree, but rather simply to learn specific design skills. This group includes people who do not have any tertiary education, people with degrees in non-design fields but who wish to enter design, and designers seeking continuing education to acquire new knowledge and skills. How certificate or other noncredit courses factor into traditional education is increasingly important as these opportunities multiply.

Internships, Cooperative Education, and Sponsored Projects
Some institutions integrate applied experiences as fundamental parts of the curriculum. This theme covers the value, frequency, conditions, and responsibilities under which students engage in some form of design employment for college credit.

Types of Institutions
Different institutions have different purposes, structures, and approaches to curriculum. There are a wide variety of issues that differ among: two-, three-, and four-year degree programs; single discipline (art/design/architecture) academies versus multi-discipline universities; liberal arts versus research or polytechnic institutions; non-profit versus for-profit schools. This theme also recognizes the challenges of creating design programs in economically developing countries.

Accreditation
The recommendations of this design initiative will undergo evaluation by governmental and professional accrediting bodies. We need to work with accreditation agencies to make it possible to pass through their requirements (or to have them change their requirements). Without approval of accreditation agencies, this effort may fail.

Cultural Representation
There is systemic discrimination within institutions, design professions, and society that influences classroom and workplace culture, hiring and promotion practices, and authenticity in reflecting the full range of stakeholders for design. There are special challenges and obligations for designers who work in and with cultures other than their own.
Student Characteristics

Characteristics of Incoming Students

As in most fields, undergraduate students enter design programs with varied motives for pursuing degrees, uneven training, and mixed perceptions of the field. A number of students will enter with design experience through previous study, high school design camps, or employment. While some students have a specific disciplinary goal in mind, others do not know enough to make these decisions. Other students may believe they can jump right into major societal issues without much background knowledge. Increasingly, master’s applicants to design programs do not have any design background. Additional coursework may be necessary to close the gap between students’ prior experiences and the demands of a design curriculum. Institutions will determine whether such coursework is prerequisite or taken concurrently with core requirements. However, Core Topics should be addressed by all curricula, regardless of student readiness or specialization.

The main implication of the varied formal training and experience of incoming students is that some may have to take appropriate courses to give them the requisite knowledge, which means schools have to prepare and teach advanced students in elementary topics.

Characteristics of Graduating Students

When design students graduate, the knowledge and skills they possess depend on several variables: the level at which they studied, the amount of design study required by their specific curriculum, and opportunities for practice while in school.

The first level of design study is tertiary education, including two-year technical degrees, three-year diplomas, and four- or five-year bachelor’s degrees (e.g. BA, BS, BFA, BDes). Graduates of these programs may find entry-level positions in companies, consultancies, non-profits, government, or other organizations, depending on the professional orientation of their programs. To move up in responsibility, most will require deep professional experience or advanced training.

The next level of study is the master’s degree, which internationally serves different purposes. In some countries, the professional master’s (MFA, MDes) serves as a terminal degree and qualifies graduates for jobs as design practitioners. Professional master’s curricula engage students in advanced work and may enroll people with or without previous design degrees. Initial master’s degrees (MA, MS, MPhil) may focus on non-studio themes — for example, design history, theory, criticism, or management — and serve as bridges to doctoral study. Successful master’s programs in design increasingly specialize in a type of practice or philosophy, preparing mature graduates for particular types of work or leadership roles. Because master’s students range from design professionals to change-of-career students in their first design study, the content and structure of curricula vary with intended outcomes. Some programs deliver instruction through a studio-based, project-driven pedagogy in work that mirrors practice, while others rely on a seminar format for some instruction. In other cases, design is paired with another discipline, such as business, anthropology, or criticism. Therefore, it is expected that graduates of master’s degrees in design to show deep competencies in some areas and bachelor’s-level breadth in others.

For those who want to become researchers or university professors, the PhD is generally required. The research profession, whether in academia or another research context, is primarily concerned with the development of new knowledge that informs design as a discipline. Some of this work develops and tests methods for better understanding by people who use research findings. Other types of research advance underlying design principles, theories, and perspectives, including those that consider the ontological nature of design in something that has been called the pluriverse. Finally, some research examines a quickly expanding range of design activities, including new kinds of problems and opportunities that arise from emerging technologies, new production processes and materials, and accelerating social concerns.
An important activity of designers with PhDs is educating undergraduate and graduate students. As faculty, PhD graduates must possess the content depth and methodological knowledge to prepare future researchers, as well as skills for maintaining their own research and publication careers. As research professionals in practice, they must generate and communicate findings that guide decision-making in companies and organizations.

In the broadest sense, expected characteristics of all design graduates include the following:

- **Observe and advocate for the user experience**
- **Communication and organizational skills**
- **Broad design principles, methods, and theoretical models**
- **Appreciation of domain-specific knowledge**
- **Awareness of implementation and advanced technologies**
- **Future oriented**
- **Real world project experience**
- **Problem framing skills**

Graduates should recognize that problem framing is subjective; that it privileges some things over others in uncertain situations and requires participation and negotiation with others in setting goals. Although many disciplines are excellent at problem solving, designers start by problem finding, by getting at the core issues. The critical characteristic of Human-Centered Design is its focus on people and their experiences as opposed to optimization of productivity and economics. Graduates should identify areas of friction in how information, products, services, and systems perform, designating leverage points where design can produce better outcomes for people.

Work typically requires teams of experts with mutual respect for different kinds of knowledge and skills. Graduates should gain working knowledge of adjacent disciplines and the ability to give and receive constructive feedback. These interpersonal skills should translate to work with internal and external stakeholders and inform arguments that champion design issues.

**Professional and Ethical Responsibility**

Graduates should harness the power of design in service of high-level goals, mitigating possible adverse effects. Their work should be accessible, reflecting concerns for differences in people’s physical abilities, cultural affiliations, and points of view. They should make compelling cases for ethical and inclusive practices with organizational and community decision-makers and integrate these issues fully in all aspects of assignments.

**Commitment to Life-Long Learning**

No curriculum can anticipate all knowledge and skills required across a fifty-year career. Graduates should be life-long learners who have a growth mindset, always observing, questioning, and learning. They should attend lectures, take courses, and read. They should also keep up with changes in technology and materials. And they should actively pursue opportunities that demonstrate willingness to apply new knowledge and perspectives to practical work.

**Pedagogical Principles**

Pedagogy refers to the means of instruction: how important themes are taught, how students assimilate essential beliefs and principles, and how faculty assess learning.
Design Education Beyond the Classroom

New designers often struggle with the messiness of design in the world, where the nice clean methods taught in the classroom need to be modified in the face of many competing constraints, stakeholder values, political views, and of course economic and time constraints.

The transition from school to work is an important pedagogical consideration. Design is a field of application to the world, yet students are usually taught idealized procedures that often must be skipped, modified, or otherwise transformed because of the practical constraints on time, resources, and complex factors outside the formal design process. Students need to understand the difference between classroom knowledge and how it is practiced. (Note that teaching idealized methods is proper: but students also need to learn how to deviate from the ideal state when this is required.)

Students can gain understanding of real-world practices and values through internships in industry, government agencies, or non-government organizations (NGOs), and by bringing outside speakers who work on applied problems into the classroom.

Social and Evaluative Pedagogical Practices

Classroom practices should foster social skills in a situated, problem-solving community. Work in studio environments supports a range of approaches and opinions through ongoing interaction with peers. Critiques are valuable, but have to be constructive and allow student reflection and response to feedback from peers, experts, and faculty.

The word “failure” should be replaced with the phrase “learning opportunity.” Quite often the best learning opportunity occurs when the student (or professional) has not succeeded or has encountered a stumbling block, a conceptual problem or knowledge deficit. This should always be treated as a positive situation (the person will likely think of it as negative), and working out the solution jointly is a powerful pedagogical tool.

Although teaching styles vary among faculty, instruction should favor coaching and safe opportunities for students to fail over an authoritarian approach that seeks “right answers” and “almost perfect” solutions. Effective pedagogies should emphasize helping students learn how to learn by themselves. Evaluation should emphasize and motivate learning by foregrounding goals rather than polished performance. Assessment should be thought of as a tool to enhance learning by showing where to support the learner.

Principles from Learning Science

Modern Learning Science has a number of simple but powerful principles for learning. Many recent theories in learning science argue against traditional structures. They call into question a fixed number of years in study with each year divided into semesters or quarters and each class assigned to a standard number of contact hours. Some programs experiment with mini-courses and accelerated learning sequences in which students progress through content at their own pace. Theories also challenge traditional methods for presenting material, including lecture as the most popular method of university instruction. Here are some examples of principles:

- Lectures for motivation, not for learning
- Problem-based learning, discovery learning, and constructionist learning
- Mastery Learning
- Flipped classrooms
- Debugging
- Motivation
- Frequent Quizzes as Tools for Remembering
Encourage teamwork, sharing, and excerpts from sources (i.e., cheating, but with attribution) Developing the proper framework for understanding.
We hope to expand upon these and other principles of pedagogy in our essay series.

References


Phase 2 of the Initiative

Working Groups (WGs)

Phase 2 of the Future of Design Education initiative is convening WGs for the development of themes that represent broad consensus and feedback from educational samples.

Each WG produces:

- A Theme definition: an essay that identifies content scope and reflects concern for beliefs, principles, and characteristics of graduates. Presentation of case histories is an efficient way to illustrate the integration of principles and subject matter.
- A bulleted list of 5-10 topics, which much like chapter titles in a book, itemize core ideas.
- For each topic, determination of whether they are core, specialized, or optional plus a statement of desired Student Learning Outcomes with a rubric.

Publishing essays

We are soliciting short essays on topics relevant to this initiative (1-3 pages).

A small editorial team will read and advise authors on essays: although these are not peer-reviewed journal articles, we will follow a reduced set of journal editing principles. Articles will be reviewed and suggestions made for improvements. Articles that are found acceptable will be posted on the Initiative website.

Intellectual property

Authors will own and control all uses of their articles: they are free to post them or reuse the content. Authors will be asked to give the Initiative permission to post and reuse these essays for the purposes of the initiative. Any use of the essays will always give full credit and names of the authors. Traditional Academic Journals do not like to publish
articles that have already been published or that are widely available, but these short, 2-3 page essays should not interfere with the future publication of expanded works.