Design for Learning — Anne-Marie Bouché

Students learn when a course communicates effectively, inspires interest and engagement, and reduces obstacles and occasions for error. These goals can be furthered when educators understand the principles of good design, and think of their products and processes as **design problems**.

A "design-oriented" approach is a general framework that creators use to develop products and processes that users are able to interact with successfully. Originally developed to facilitate product design, the general principles apply to any situation where a user has to interface with the environment to achieve a specific goal or result.

Design professionals have long understood that good design must be **user-centered**. It does not matter if an everyday device is aesthetically pleasing, if you can't find the "on" button or figure out how to work it without a manual. The same applies to education.

If students have trouble knowing what to do first, or where to find course materials, design can help. A good design creates a clear path so the user understands immediately what they need to do.

A design-informed approach to education….

- Shifts the focus from the teacher and what the teacher is trying to accomplish, to the student — who the students are, what situational factors affect their learning, and what they need to be successful.
- Recognizes the importance of social and emotional factors in learning, and designs around that reality.
- Makes courses more broadly accessible and inclusive.
- Provides redundancy so that there is more than one path to successfully complete a task or find information.
- Reduces friction - student and faculty frustration, distress, extra work and system failure.
- Provides nudges, constraints and feedback so that students are guided to the desired end with minimal error and confusion.
- Makes the mechanics of teaching and learning easier for faculty and students alike.
- Provides a structured framework for evaluating and developing a course over time.

In education, we speak of "designing" whole courses but also curricula, assignments, syllabi and assessment methods such as rubrics. We can also apply the concept of design more narrowly to the visual and functional qualities of course materials (syllabi, textbooks, websites).

The basic principles of good (and bad) design have been articulated perhaps most effectively by Don Norman in his classic book, ***The Design of Everyday Things***. Here are some of Norman's concepts that are especially applicable to teaching and learning:

- Visibility (being able to "see" the system and understand how you need to engage with it)
- Affordances (how a system part implies and allows an action) and signs (how the part's shape or appearance signals what action is required)
- Conceptual models, users' prior experience and assumptions: "Designer's model" vs. "User's model"
- Constraints (promoting right interactions, hiding or preventing wrong ones)
- Feedback / confirmation (when a state changes, communicating that something has happened)
- Perceiving and evaluating the outcome after an interaction
- Detecting and correcting errors

The following bibliography includes some specific models that have been created to guide educators in designing courses, curricula and individual learning activities, but also some general works on design that I believe provide a useful framework for considering design from a broader viewpoint.

READING LIST

Two design classics and a graphic design handbook:

Norman, Donald A. (2002, 1988). ***The Design of Everyday Things***. New York: Basic Books.

This book and the following title by Lidwell et al. should be the basic starting point for everyone interested in the design of educational materials and processes. Although Norman's book is ostensibly about "industrial design," it lays out principles that can be applied to all design. Norman is a psychologist who developed concepts to explain how people interact with their environment and what makes some things easy and others very difficult. Students interact with courses and learning-objects the way we interact with processes and objects in our everyday environment, such as the phones in our offices, the instructions for assembling furniture or a government website. We need to think about what features make those types of interactions easy and intuitive and which ones make them difficult and error-prone, and design our courses and course materials accordingly.

Lidwell, William, Kritina Holden and Jill Butler. ***Universal Principles of Design: 125 Ways to Enhance Usability, Increase Appeal, Make Better Design Decisions and Teach Through Design*** (2003, updated 2010). Gloucester, MA: Rockport Press.

This is an A-Z manual that applies to design in general but quite a few of the entries are applicable to learning objects and processes. These are true, broad "universal principles," not to be confused with the educational approaches that also include in their names the phrase, "universal design." Simply knowing about a concept can help us begin the process of re-thinking how we do things.

Williams, Robin. (2004) ***The Non-Designer's Design Book : Design and Typographic Principles for the Visual Novice***. Berkeley: Peachpit Press.

A very basic introduction to a few key (graphic) design principles that, once understood, can be profitably applied to any text-based object that communicates information. Written in an accessible and good-humored style, it is also an advertisement for and embodiment of the principles it is trying to teach.

Additional sources:

Bowe, Frank. (2000). ***Universal Design in Education: Teaching Nontraditional Students***. Westport, Conn.: Bergin & Garvey. FGCU: **LB1028.38 .B69 2000**

Includes a thoughtful discussion of the many kinds of diversity that exist in the classroom, with suggestions for modifying teaching strategies and materials to make them more accessible. The author's "non-traditional" label includes students with disabilities, students that are from diverse ethnic or cultural backgrounds, and those who are from a different age demographic from the majority.

Burgstahler, Sheryl, & Cory, Rebecca. (2008). ***Universal Design in Higher Education: From Principles to Practice***. Cambridge, MA: Harvard Education Press. FGCU: **LC4820 .B874 2008**

CAST (2008) ***Universal Design For Learning Guidelines 1.0.*** Wakefield, MA: CAST. Retrieved Sept 23 2018 from: http://cast.org/publications/UDLguidelines/version1.html

This is an outline that fleshes out the basic principles articulated by CAST with detailed specifics. I don't know if it has been updated since (perhaps in some of the later publications) but this is a handy and compact place to get the gist. Technology plays a secondary role in the version laid out here. Argues that it is not students, but curricula that are "disabled" – that are ill-adapted to the actual range of students.

Gordon, David, Anne Meyer and David Rose (2014). ***Universal Design for Learning.*** Peabody : CAST Professional Publishing. FGCU: E-book

As conceptualized by David H. Rose, Ed.D. of the Harvard Graduate School of Education and the Center for Applied Special Technology (CAST), Universal Design is supposed to facilitate access to education for the widest possible range of learners by providing:

- *Multiple means of representation* to give learners various ways of acquiring information and knowledge,
- *Multiple means of expression* to provide learners alternatives for demonstrating what they know, and
- *Multiple means of engagement* to tap into learners' interests, challenge them appropriately, and motivate them to learn.

The concept of "universal design" was originally developed when concerns about diversity and inclusion met emerging new technologies that seemed to offer new ways to achieve the aims of expanding access. Thus, the "universal design" literature as it has developed since then is often focused towards technology-based solutions. However the general principles go beyond specific technological solutions.

Hall, Tracey E., Anne Meyer and David H. Rose. (2012) ***Universal Design for Learning in the Classroom: Practical Applications***. Guilford Press.

Almost entirely technology-oriented, but has one chapter on "Universal Design for Learning 'Unplugged': Applications in Low-Tech Settings"

Hasso Plattner Institute of Design at Stanford (d.school): ***An Introduction to Design Thinking Process Guide***

This graphic PDF walks us through the five steps of the "design thinking" process used in the Stanford Design School: **Empathize, Define, Ideate, Prototype** and Test. Although it was initially developed in the context of engineering, the model is applicable to a wide range of design problems, including instructional design.

While superficially similar to other design frameworks, such as the ADDIE model used by instructional designers (Analysis, Design, Development, Implementation, and Evaluation), the "design thinking" model presented here has some interesting advantages.

First of all, in keeping with its humanistic philosophy, it starts the design process with empathy — understanding the user and all the stakeholders. Secondly, it puts creativity front and center, giving "ideate" its own step. It is designed to address "wicked" problems — complex situations that are characterized by ambiguity and conflicting needs, such as those encountered in educational settings. Third, unlike the ADDIE model, it does not envision a simple linear progression through the design process. The "prototyping" stage for example might involve creating and experimenting with multiple

models. Finally, the process is explicitly iterative — it circles back on itself as many times as is necessary until a final design is created.

Mount Saint Antonio College Library. ***Universal Design for Learning (UDL): UDL Syllabus Rubric*** https://mtsac.libguides.com/udl/syllabus

This webpage, which grew out of a faculty inquiry group at the college, has some excellent examples of well-designed visually-enhanced syllabi. The first one listed (scroll down and look on the right hand side of the page) is an Art Appreciation online syllabus that has some outstanding features and is rhetorically one of the clearest and friendliest ones that I have seen.

Peters, Dorian (2013). ***Interface Design for Learning: Basic Principles A-Z.*** Berkeley Ca.: New Riders Press.

Has some informative chapters especially "Learning is social" and "learning is emotional." Focus is screen-based learning but general principles apply more widely.

Rose, David H. and Anne Meyer, with Nicole Strangman and Gabrielle Rappolt (2002). ***Teaching Every Student in the Digital Age: Universal Design for Learning.*** Alexandria, VA: Association of Supervision & Curriculum Development.

Rose, David H. et al., "Universal Design for Learning in Postsecondary Education : Reflections on Principles and their Application." ***Journal of Postsecondary Education and Disability*** (19:2): 135-151.

The authors discuss their experience with applying the core principles of Universal Design for Learning to their own class on …. Universal Design for Learning. Like many college classes, their class relies on lectures and textbooks so their discussion is very relevant to what most teachers do. It is also an accessible introduction to the principles themselves.

Scheer, Andrea, Christine Noweski and Christoph Meinel. (2012) **"Transforming Constructivist Learning into Action: Design Thinking in Education."** *Design and Technology Education* 17:3: 8-19.

This source does double duty: it explains in clear terms what a "design thinking" process looks like, and it describes how this process can be used with to create constructivist learning experiences in the classroom. Equally, the same process can be

applied to developing courses and parts of courses. The authors focus on K-12 education but the framework applies equally to college-level teaching and learning.

Sosnoski, James. **(**1999) **"Hyper-Readers and Their Reading Engines."** in: *Passions, Pedagogies, and 21st Century Technologies.* Ed. Gail E. Hawisher and Cynthia Selfe. Logan: Utah State UP, p. 161-77.

This influential (though dated) article, widely cited in the literature, argues that readers read differently on screen than in printed text. Sonoski identifies a number of strategies that, he says, are used by readers of web material, such as "pecking," "skimming," and using the visual content preferentially to construct meaning.

This naturally has implications for how college instructors design our material, what we give students to read and how we expect them to read it.

University of Leicester, Leicester Learning Institute "Writing and Structuring Online Learning Materials" (n.d.) https://www2.le.ac.uk/offices/lli/case-studies-and-resources/repository/learning-and-teaching-resources/writing-and-structuring-dl-materials/view

There are many institution-produced guidelines like this one that can be found on the Web. This one has some concrete tips in it that some may find useful, such as how to calculate how much text to assign based on reading rates for different kinds of material, and a statement to the effect that we take in 25% less when we read online, and that a good rule of thumb is to limit our screen-reading content assignments to about 50% of what we assign in print sources (though no source is cited for this). It also has good advice about chunking material, using headings, summaries and recaps, and other basic design considerations that apply to the presentation of textual material. This has been around for some time and is undated but one of the cited resources at the end originated from E-Learning at FGCU! (though sadly that link is now expired).

Vanderbilt University Center for Teaching: Teaching Guides. https://cft.vanderbilt.edu/guides-sub-pages/

Many institutions have similar websites where resources for faculty are gathered. This one happens to be especially comprehensive and has an extensive series of useful individual "teaching guides" on practical topics, many of which deal with design.

Watson, Andrew D. (2015) **"Design Thinking for Life."** *Art Education* (68:3): 12-18.

The article is about using design thinking methodology in the classroom but it also provides a very clear introduction to what "design thinking" is and how it can be applied to any design process.

Wiggins, Grant and Jay McTighe. ***Understanding by Design*** (2005) 2nd expanded edition. Alexandria, VA.: Association for for Supervision and Curriculum Development.

This is the "Bible" for designing courses and curricula using a "backwards design" model. In this approach, learning goals are developed first. Second, assessment plans are developed to assess whether those goals were reached. Finally, the course content is designed around the goals and assessments that have been previously established.

Wormak, Anne-Marie, et. al. ***Accessible Syllabus:*** *Accessible classroom resources promote student engagement and agency.* https://www.accessiblesyllabus.com/

The stated emphasis is on making a syllabus accessible for students with disabilities but the suggestions really apply to any syllabus and they are easily implemented, practical and (once you encounter them) obviously an improvement.