

Critical Thinking for Designers

Target Students: Industrial Design Students -Undergraduates & Graduate Level

1. Problem/Challenge:

Products, both tangible and intangible, represent solutions to every kind of problem imaginable. In one capacity or another industrial designers have a hand in the development of those products. Industrial design students are taught a variety of hands on skills and the arts which relate to the industrial design profession. These courses include drawing, graphic design, 3D-form & design, design history, technical drawing. Current trends in traditional product design indicate that design itself is becoming a commodity following in the foot steps of manufacturing. Additionally consumer driven design is also changing what designers really do. One of the most important skills needed by designers in the new economy, if not the most important, is the ability to think critically about a given situation in order to pinpoint problems and develop viable solutions.

Lack of Critical Thinking Skills directly impacts the teaching of the current ID-Presentation class as well as hinders students from gaining the full benefit of their other ID classes. During the course of teaching students presentation skills it became apparent that they lack the skills needed to build a coherent argument supported by facts and information.

2. Proposed Solution:

Develop a course that consists of exercises that will introduce students to critical thinking then to use those skills to identify problems, to clarify and validate problems and to develop and evaluate solutions.

Resources:

Technology-DVD: “How to Teach Critical Thinking” - Richard W. Paul

Internet: www.CriticalThinking.org

Reading List:

“Miniature Guide to Critical Thinking” -Richard Paul and Linda Elder

“The Art of Deception: An introduction to Critical Thinking”- Nicholas Capaldi and Miles Smit

General time-line for project: ^{1st} Semester 2010

Obstacles: (Based on current students) language barriers and student perceptions

3. Syllabus

Course Objective: This course will help students understand the process for developing a coherent and compelling argument with supporting information and to apply these skills to the development of solutions. To achieve this students will learn critical thinking skills, explore industrial design solutions from the past, discuss with guest speakers current business, marketing & design situations from a critical thinking perspective. When students complete this course they will be able to identify problems, validate & confirm those problems- then develop and validate their solutions.

10 Weeks – 20 Class sessions.

Class 1: Why Critical Thinking & Metacognition ?

* Reading assignment

Class 2: Critical Thinking & How it applies to industrial design

* Reading assignment

Class 3: Elements of Thought & Checklist for Reasoning

Tools for visual thinking- Mind Maps

* Reading assignment

Class 4: Questions Using the Elements of Thought

The problems of Egocentric Thought

* Reading assignment

Class 5: Universal Intellectual Standards

Templates for Analyzing the logic of Articles & Textbooks

* Reading assignment

Class 6: Criteria for Evaluating Reasoning

Essential Intellectual Traits

* Reading assignment

Class 7: Three Kinds of Questions

A Template for Problem Solving

* Reading assignment

Class 8: Analyzing And Assessing Research

What Critical Thinkers Routinely Do

* Reading assignment

Class 9: Stages of Critical Thinking Development

* Reading assignment

Class 10-20:*(Sessions below will be interspersed with the above classes as time & schedules permit)*

Explorations into industrial design situations to discover, evaluate problems and solutions

Guest Speakers from various business, marketing, manufacturing & design firms

Explorations of projects assigned in ID classwork

4. Citation of Articles:

A Plea for More Critical Thinking in Design, Please

BY [John Barratt , President & CEO Teague \(design\)](#) Mon Aug 10, 2009 at 1:16 PM

Lately I've been thinking a lot about thinking. For reasons that are difficult for me to identify, it seems that the design industry lacks any real form of critical thinking. By that I mean a careful and deliberate analysis that's intended to identify genuine existing conditions, rather than the conditions that those with vested interests may want us to believe are true. Could be that the design industry isn't large enough to warrant professional critics, or that the market isn't great enough to consume these critiques, or perhaps that designers are uncomfortable criticizing their colleagues' work? Or maybe it's just that as an industry we are content, or that the intended audience has yet to develop a criterion for evaluation? For whatever reason, my observation still stands: critical thinking in design, whether from historians, educators, authors or journalists, is largely absent.

Change by Design:

About halfway through [Change by Design: How Design Thinking Transforms Organizations and Inspires Innovation](#), Tim Brown repeats Tom Peter's much cited comment that "the MFA is the new MBA." In doing so, however, he doesn't fully endorse the sentiment. Instead Brown observes that the dynamic skills required in business share as much in common with the creativity required for a design practice as they do with the critical thinking required for the MBA. On the back of the book jacket the author observes, "this is not a book by designers for designers, this is a book for creative leaders who seek to infuse design thinking into every level of an organization." In that way it straddles the gulf between the MFA and the MBA. Clearly learning to draw is a far sight from learning how to run a discounted cash flow analysis and the skill set doesn't overlap. We need both MFAs and MBAs. But the crux of what Brown is getting at is what McKinsey & Company referred to as the "T-Shaped" person, where the vertical axis represents the depth of the skill set that forms their core competency. Valuable design thinkers, however, "cross the T," holding not only deep familiarity with their core role, but also a disposition for collaboration across enterprises. A "design thinker" isn't just an artist and isn't just a number-cruncher. Instead they need to be knowledgeable enough about each to be conversant: to be a member not of a multidisciplinary team but of an *interdisciplinary* team.

Metacognition

KNOWING HOW TO LEARN, and knowing which strategies work best, are valuable skills that differentiate expert learners from novice learners. Metacognition, or awareness of the *process of learning*, is a critical ingredient to successful learning.

Metacognition is an important concept in cognitive theory. It consists of two basic processes occurring simultaneously: *monitoring your progress* as you learn, and *making changes and adapting* your strategies if you perceive you are not doing so well. ([Winn, W. & Snyder, D., 1998](#)) It's about self-reflection, self-responsibility and initiative, as well as goal setting and time management.

"Metacognitive skills include taking conscious control of learning, planning and selecting strategies, monitoring the progress of learning, correcting errors, analyzing the effectiveness of learning strategies, and changing learning behaviors and strategies when necessary." ([Ridley, D.S., Schutz, P.A., Glanz, R.S. & Weinstein, C.E., 1992](#))

5. Faculty Support :

Current RIT faculty will be invited as speakers to address areas of: Logic, Writing, Philosophy as pertinent to the class development.

6. Assessment method:

Students must demonstrate clearly articulate, present and defend their arguments during presentations of assignments.

7. Timeline: First Semester 2010

