

COGS 230/CSE 216:

Interaction Design Research

WI24

Lecture 3 - Design Process

Announcements



Brainstorm Due Tomorrow

Commentary due Tuesday

Email instructor if you don't have
discussion assignment

Project details updated on website

No in-person class Oct. 8th - vote on piazza,
see forthcoming announcement about the
plan,

**Design and creation are
not static processes.**

**They can be studied,
supported and improved.**

Design

Brainstorming process
Early-stage design tools

4

Evaluate

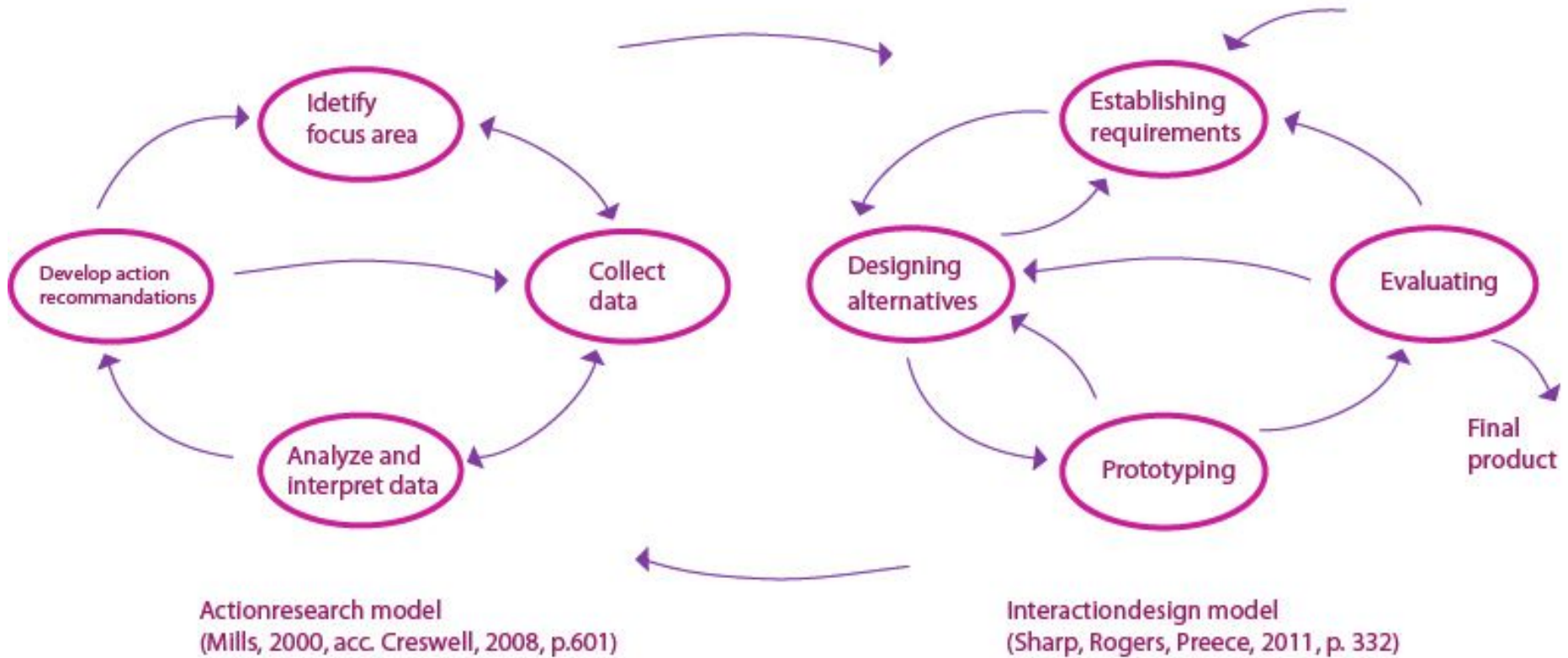
Study strategies
Cognitive modeling

Implement

Programming tools
WYSIWYG design tools
Rapid prototyping tools

Recall: process improvements to design

Actionresearch model in iterative design proces with the Interactiondesign model



Design as research

Design-oriented HCI

[Fallman, CHI '03]

- HCI is distinct from natural or social sciences: its methodology is based in design
- Design is a context-dependent dialogue with the problem
- Perspectives on design
 - Conservative: as a scientific or engineering endeavor
 - Romantic: “imaginative masterminds equipped with almost magical abilities of creation”
 - Pragmatic: design is a reaction to a context

Design as a process

Iterate on a design, or create parallel alternatives?

[Dow et al., TOCHI '10]

- Feedback on five iterations or five parallel alternatives
- Quality measured via ad clickthrough
- Designs generated in parallel condition had ~1/3 more clicks

9



Design as a
skill/resource

State of Design: How Design Education Must Change

[Don Norman, Linkedin '14]

- **Design Thinking:** ensuring that the correct problem is being solved. 11
- **Systems Thinking:** cutting across and encompassing all disciplines.
- **Integrative:** blending of practice and theory.
- **Human-centered:** assuring that people and technology work harmoniously as collaborative players



Design Process

Tuan T., Jacob L., Andres M.

Presented in CSE 216/COGS 230 on October 3, 2024

Today's Discussion Plan

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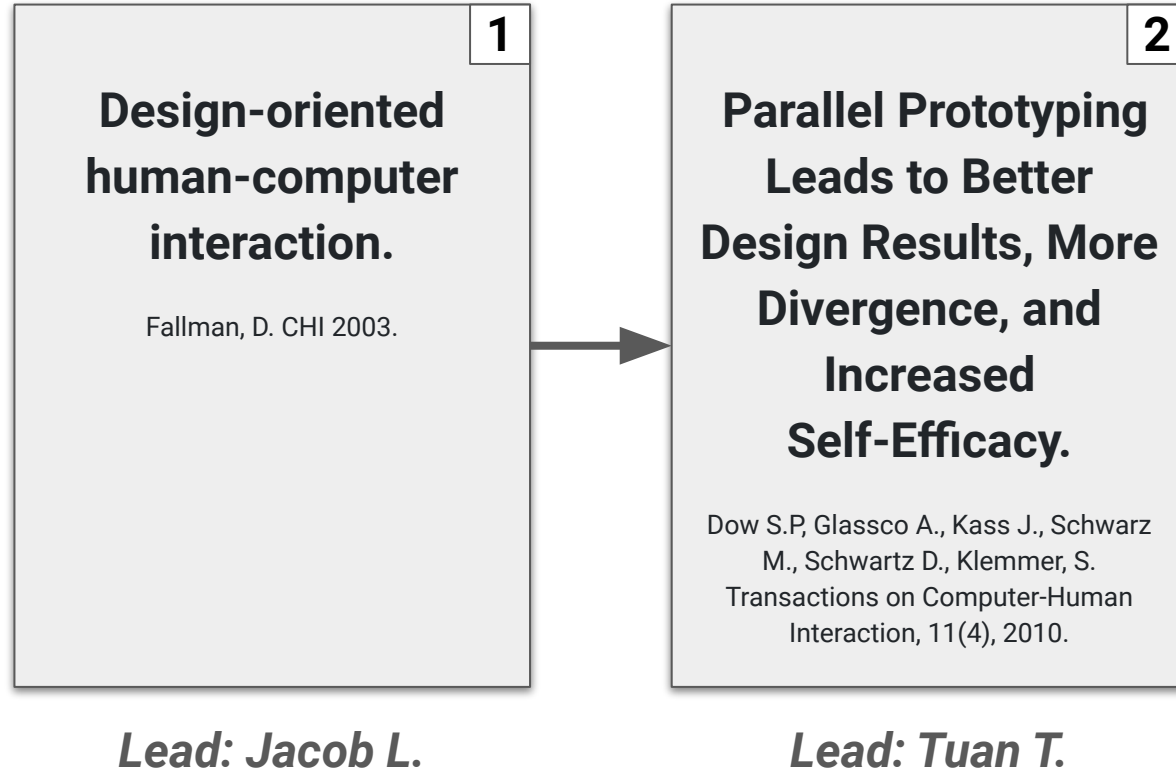
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Design-oriented human-computer interaction.

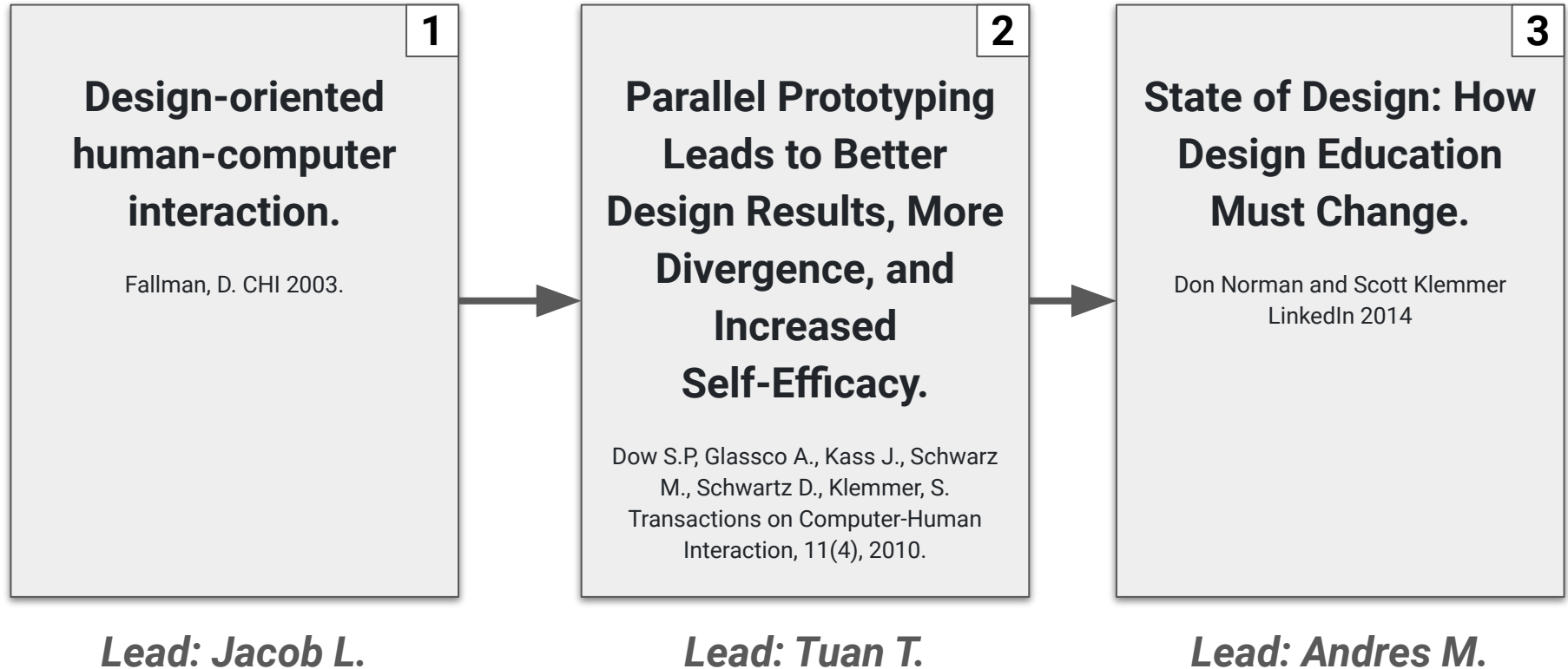
Fallman, D. CHI 2003.

Lead: Jacob L.

Today's Discussion Plan



Today's Discussion Plan



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	Conservative Account	Pragmatic Account	Romantic Account
Designer	An information processor; a <i>'glass box'</i>	A reflective, know-how bricoleur; a <i>'self-organizing system'</i>	A creative, imaginative genius; an artist; a <i>'black box'</i>
Problem	Ill defined and unstructured; to be defined	Unique to the situation; to be set by the designer	Subordinate to the final product
Product	A result of the process	An outcome of the dialogue; integrated in the world	A functional piece of art
Process	A rational search process; fully transparent	A reflective conversation; a dialogue	Largely opaque; mystical
Knowledge	Guidelines; design methods; scientific laws	How each problem should be tackled; compound seeing; experience	Creativity; imagination; craft; drawing
Role model	Natural sciences; engineering; optimization theory	Bricolage; human sciences; sociology	Art; music; poetry; drama

Figure 1: Summarizing Table (in part based on [11])

Lead: Jacob L.

What is Design?

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So what is design?

All of it is design, from problem setting to problem solving to the nitpicky details, there is design in each part, but design is also the whole.

What design means to you?

Sketching as a way of thinking

Parallel Prototyping Leads to Better Design Results, More Divergence, and Increased Self-Efficacy.

Dow S.P, Glassco A., Kass J., Schwarz
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Transactions on Computer-Human
Interaction, 11(4), 2010.

Lead: Tuan T.

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Fig. 1. The experiment manipulates when participants receive feedback during a design process: in serial after each design (top) versus in parallel on three, then two (bottom)

H1. Parallel prototyping leads to feedback comparison and produces higher quality designs.

Table I. Summary of Campaign Data from MySpace and Google Analytics (standard deviation in parentheses)

	Parallel	Serial
Performance data from advertising host (MySpace.com)		
Total impressions	665,133 (43968)	515,187 (36373)
Total clicks	296 (22.8)	205 (19.1)
Clicks per million impressions	445.0 (18.3)	397.9 (19.6)
Performance data on client site (Google Analytics reports)		
Total visitors	264 (19.9)	158 (15.3)
Average time (sec) per visitor	31.3 (143)	12.9 (79.9)
Pages visited on site	394 (31.6)	198 (21.1)
Pages visited per visitor	1.49 (0.48)	1.25 (0.41)

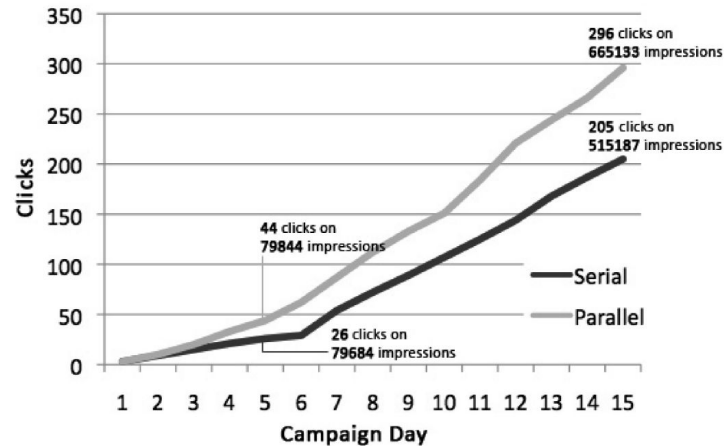


Fig. 7. Parallel ads received more clicks—and more clicks per impression—than serial ads during a 15-day campaign.

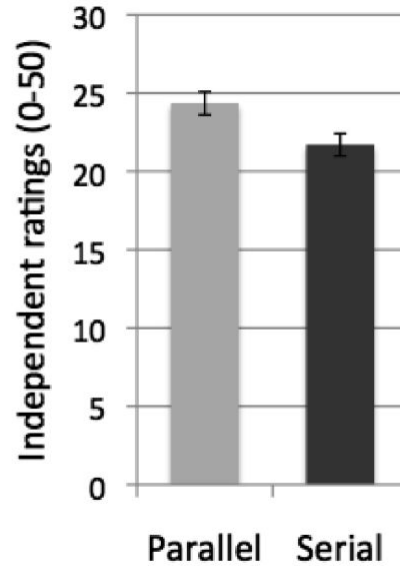


Fig. 8. Parallel ads received higher average independent ratings (0–50 scale) than serial ads.

H1 Takeaways and Discussions

Takeaway:

- Designs from parallel prototyping methods rated higher and performed better

Discussion:

1. While parallel prototyping showed to produce higher quality designs, what are potential costs?
2. Any example of products that were designed through parallel prototyping?

H2. Parallel prototyping results in more divergent concepts.

H2 Takeaways and Discussions

Takeaway:

- Parallel Ads Were Rated More Diverse ($\mu = 2.78$, $SD = 1.66$) Than Serial Ads ($\mu = 3.25$, $SD = 1.96$)

Discussion:

1. Why did parallel ads developed in more divergent directions compared to serial ads?
2. What is the benefits and consequences of more divergent design directions?

H3. Parallel prototyping leads to a greater increase in design task-specific self-efficacy.

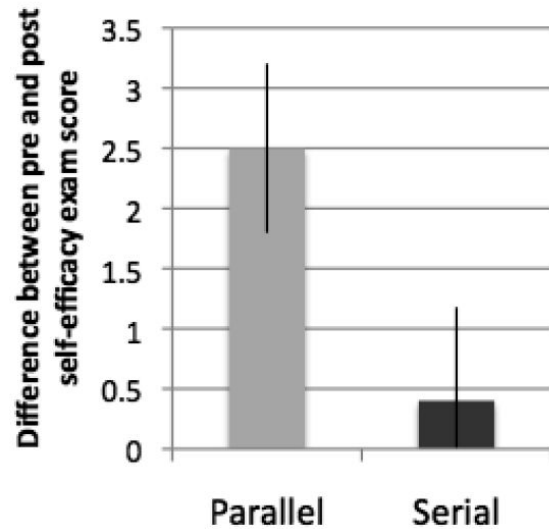


Fig. 9. Participants in the parallel condition reported a greater increase in self-efficacy from pre- to post-design task.

H3 Takeaways and Discussions

Takeaway:

- Parallel Participants' Ad Design Self-Efficacy Increased

Discussion:

1. What the benefits of an increase in Designer's Self-Efficacy?
2. Have you have experienced an increase in your self-efficacy?

Key Takeaways

Parallel Prototyping:

- Promotes Comparison
- Encourages Exploration
- Fosters Design Confidence

State of Design: How Design Education Must Change.

Don Norman and Scott Klemmer
LinkedIn 2014

Lead: Andres M.

State of Design: How Design Education Must Change.

Don Norman and Scott Klemmer
LinkedIn 2014

“Design is the practice of intentional creation to enhance the world”



Figure: Word cloud generated from text of LinkedIn post and comments on the post (constructed by Andres M.)

Lead: Andres M.

Jeopardy

- An American TV game show that reverses the traditional question-and-answer format of many quiz shows
- Example:
 - Host:
 - The name of the student presenting this slide
 - Participant:
 - Who is Andy?

Summary of Paper (Jeopardy Style)

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1. What is design and why is it exciting?
2. What is “design thinking” and why is it important?
3. What needs to change with the traditional design fields to better suit our modern world?
4. What is holding back design?
5. What are the four characteristics that make design so transformative?

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9. Where do existing design theories come from? As designers, how do we augment these theories and the research venues which produce them?
10. What should design education emphasize today? What did it emphasize before?
11. Why should designers begin to adopt more of a systematic approach instead of relying on the traditional combination of craft skill and carefully honed intuition?
12. In practice, why do generalists and specialists need each other?
13. What shift is needed in the university evaluation process to encourage both generalists and specialists?
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Discussion (1/6)

Takeaways:

The four characteristics that make design so transformative:

1. Design Thinking: ensuring that the correct problem is being solved
2. Systems Thinking: cutting across and encompassing all disciplines
3. Integrative: blending of practice and theory
4. Human-centered: assuring that people and technology work harmoniously as collaborative players

Discussion (1/6)

Takeaways:

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Discussion:

1. Can you think of another characteristic?
2. Try to find an example of a project/product that is missing one or more of these characteristics.

Discussion (2/6)

Discussion:

1. What is needed for design to be more of a science than a craft?
2. Why does it matter if it's more of a craft/art than a science?

Discussion (2/6)

Discussion:

1. What is needed for design to be more of a science than a craft?
2. Why does it matter if it's more of a craft/art than a science?

Takeaways:

- To make it more repeatable/teachable, design requires a more rigorous and principle-based curricula that integrates knowledge from its relevant disciplines
- Cooking and Design: cooking is considered an art but there is a definitely a set of fundamental principles/techniques that facilitate the creative expression of the cook.

Discussion (3/6)

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Takeaways:

- Theories come from many different disciplines (e.g., computer science, mechanical engineering)
- “We need theories and approaches that combine the analytic with the synthetic, the knowledge of science and engineering with the practice of design. Alas, traditionally trained designers play a surprisingly small role in creating, challenging, and advancing practical theory.”

Discussion (4/6)

Discussion:

1. What should design education emphasize today?
2. What did it emphasize before?

Discussion (4/6)

Discussion:

1. What should design education emphasize today?
2. What did it emphasize before?

Takeaways:

- “In earlier years, designers were trained in form, function, materials, and aesthetics. Today, culture and emotion are central, plus knowledge of societal issues, techniques for subtle persuasion, and the intricacies of complex, interdependent systems”
- “Design education must change”

Discussion (5/6)

Discussion:

1. What shift is needed in the university evaluation process to encourage both generalists and specialists?

Discussion (5/6)

Discussion:

1. What shift is needed in the university evaluation process to encourage both generalists and specialists?

Takeaways:

- A shift which values “broad synthesis, integration, and real-world impact when appropriate. This shift can enable world-class programs that celebrate both craft and theory, and trains students to augment depth with breadth to tackle the multifarious challenges we face.”

Discussion (6/6)

Discussion:

1. What new curriculum do the authors envision?
2. How will it address the lack of hard, rigorous theory in the design discipline?

Discussion (6/6)

Discussion:

1. What new curriculum do the authors envision?
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Takeaways:

- “In our vision, these new programs combine learning the art and craft of beautiful, pleasurable well-crafted design with substantive courses in the social and biological sciences, in technology, mathematics and statistics, and in the understanding of experimental methods and rigorous reasoning. Programming and mechatronics are essential skills in today’s product world.”

Overall Takeaways

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- Design is an exciting and transformative discipline/process but it needs to be taught differently to address modern design needs

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- Design is an exciting and transformative discipline/process but it needs to be taught differently to address modern design needs
- Design education relies heavily on practitioner wisdom and is missing a practical unifying theory of design
- Designers should adopt a more scientific/systematic approach to help develop a theory of design
- Universities should adopt policies that better support “generalists” faculty and design programs that integrate many disciplines into cohesive course sequences

Thank you for your attention and participation!

