Characterizing Innovation Styles to Improve Design Education

Engineering Education

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Problem Statement

**Innovation is difficult to foster/teach**

- Innovation is a moving target
- Different problems require different approaches
- People think and learn differently (e.g., equations vs graphical models)
- How do environments help or hinder innovative processes?
Approach & method

1. Surveys: Assess designer innovation styles at I/UCRC companies
2. Design Experiments: Check for correlations between innovation styles and types of design tasks
3. Repeat with Engineering and Design and Human Environment students at OSU
4. Formulate design environments to support improved performance for design tasks
5. Repeat Design Experiments in formulated environment, and assess environments’ impacts
Current state of practice & research

- Techniques exist for:
  - Measuring learning styles
  - Measuring design creativity
  - Stimulating designer innovation

- What’s missing:
  - Quantitative evidence linking individual learning styles, personality attributes, design task types, environment types, and design performance
  - Environment construction guidelines to maximize innovation per personality and task type
Deliverables & benefits

- Approaches for assessing, teaching, and facilitating innovation
  - Methods and tools to determine innovation styles
  - Course modules for teaching multiple approaches to innovation
  - Techniques for tailoring design instruction to the different learning styles
  - Techniques for providing design environments that facilitate innovation in designers with different personalities
Project plan

- Year 1:
  - Designer innovation survey at I/UCRC companies and OSU
  - Design task completion by companies and OSU students

- Year 2:
  - Formulation of ideal design environments
  - Studies to assess design environments and guide improvements
How ours is different

- Focus beyond innovation assessment, toward studying the effects of design environment on innovation at various design phases
Industrial relevance

- Innovative companies are turning to nontraditional workspaces to get the best performance from their designers.
- Industry can use the tools produced by this research to facilitate a design practitioner’s performance during design projects.