# Designing Teams for Innovation and Education

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## Abstract

*This poster outlines the work in progress / plan of study for the Ph.D. in Design Science. Our understanding of the nature of learning has evolved from stimulus-response through information processing to knowledge construction. Knowledge construction is a creative process that increasingly involves teams of people with different skills. Team experiences are being utilized in business for innovation and in education at various levels from college down through middle schools. The fundamentals of successful creative teams are explored using System Design principles and methods of organizational and individual learning. The factors that team designers use to increase innovation and educational efficacy are brought into a design framework which can be replicated to help meet the challenging task of teaching students to learn through interdisciplinary, creative, team projects.*

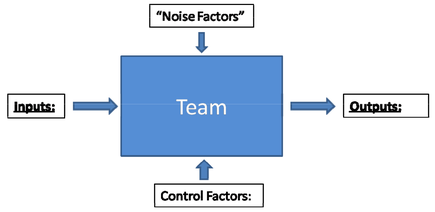
## Background

Previous research has elucidated how we learn as individuals alone and in collaboration with others. Organizational research has informed how to manage larger more permanent groups. Several organizations have created successful team experiences . Many colleges are challenging their students to learn to work as teams and to create new ideas and even new businesses. Organizations such as FIRST (For Inspiration and Recognition of Science and Technology) have developed a process to help community members coach students in creative teams.

## Characteristics of Teams for Innovation and Education

- Well defined membership
- Limited in time with defined end-state
- End-state requires innovation or creativity to reach (rather than following steps)
- Composed of individuals
- Collaboration expected
- Setting well defined

## P-Diagram of Team




## Factors Affecting Team Performance

- Setting
- Individual members' temperaments
- Individual members' goals
- Observation of/ interaction with other teams
- Practice at being a team member
- Coaching
- Reflection / self evaluation

## Assessing Teams

**CATME**

Comprehensive Assessment of Team Member Effectiveness
5 areas of assessment:

- Contributing to the team's work
- Interacting with teammates
- Keeping the team on track
- Expecting quality
- Having relevant knowledge skills and abilities

**TEAMOLOGY**

Teamology (D. Wilde of Stanford) Personality Types related to Team skills

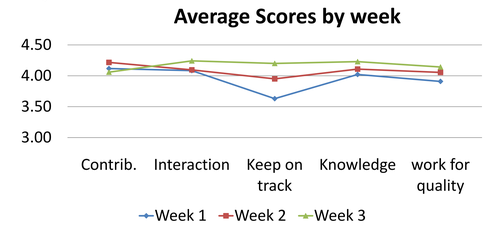
| | PERCEPTION | | JUDGEMENT | |
|---|---|---|---|---|
| Extrovert | *Experimental* | *Ideation* | *Organization* | *Community* |
| Introvert | *Knowledge* | *Imagination* | *Analysis* | *Evaluation* |
| | Sensing | Intuition | Thinking | Feeling |

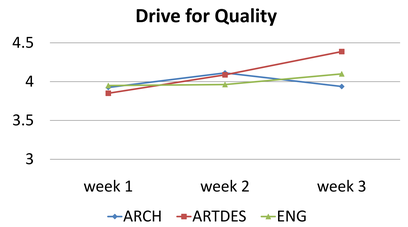
## Examples of potential study topics

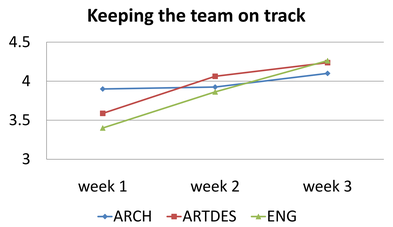
- FIRST and FIRST Lego League
  - Teams of High School kids
  - Self selected or recruited friends
  - Coaches provided with guidance
- Stanford Engineering Teams
  - Engineering Students
  - Sorted by personality – team preferences
- Smartsurfaces Course at U of M
  - Multiple team experiences
  - Three disciplines
    - Architecture
    - Art and Design
    - Engineering

## Smartsurfaces (year 1)

24 students 8 from each of Art, Architecture and Engineering . Four short and 1 long team projects with teams of six students (2 from each discipline)

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