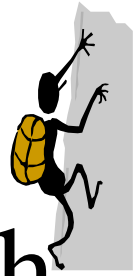# Scaling the Vertical Learning Curve of System Dynamics with Silicon Valley Managers
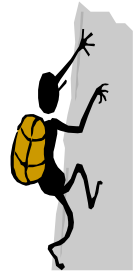
Karen Takle Quinn, Ph.D.,

Sylvia Shafto, Ph.D. , C.J. Kalin, Ph.D. & Francis Thomas Quinn, M.S.

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Silicon Valley Managers

- Have good IT skills
- Have time constraints
- Work in high tech complex environments
- Need to understand their assumptions and mental models
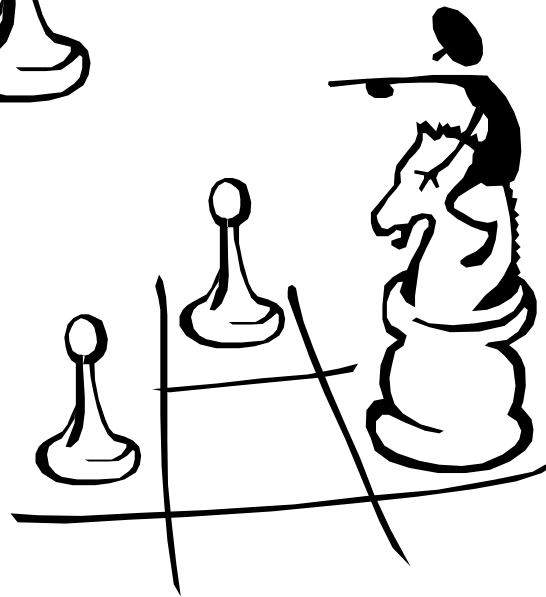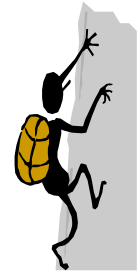- Need system dynamics know-how for better decision making
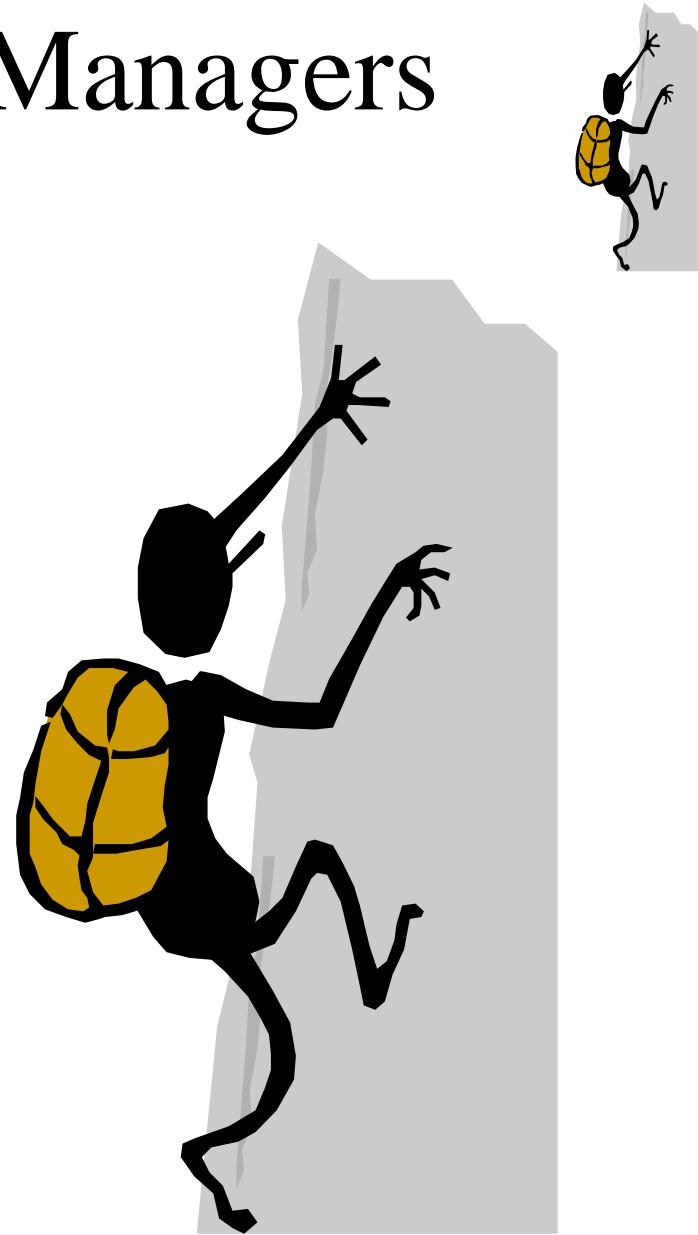
College of Notre Dame offers

- Offers fast paced intensive systems thinking based courses

- Uses F2F and online WebCT environments

- Develops team based and individual growth

- Helps students to use system lens to examine decisions
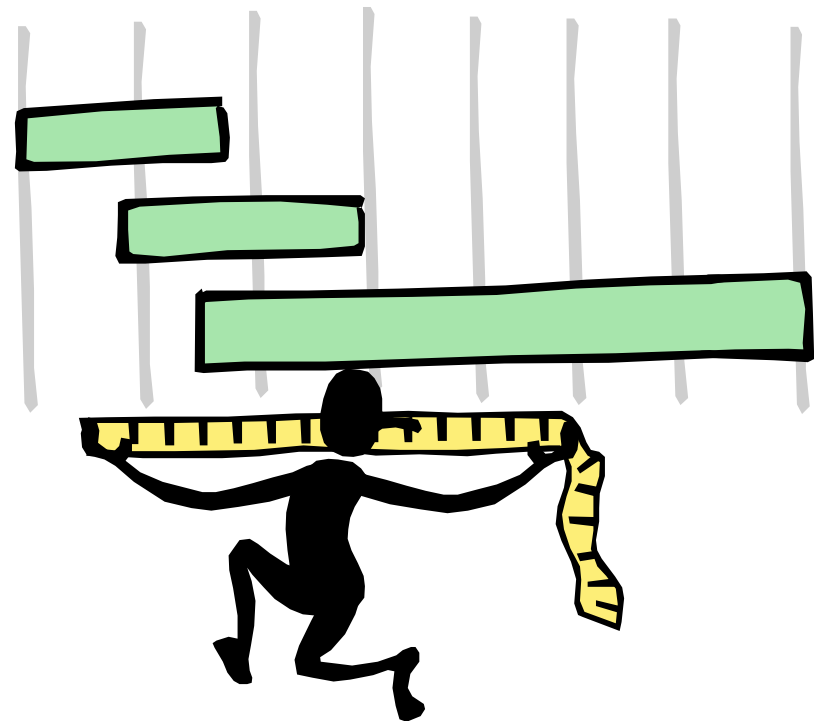
Faculty members

- Recognize the challenges of vertical learning curves
- Design learning to parallel business needs
- Want to know which sources are effective
- Need feedback from students to enrich learning experiences

Research Process

- Asked for volunteers
- Sent Consent Letters
- Interviewed participants
- Analyzed data
- Created Q Sort
- Validated findings
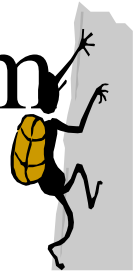- Shared research results with students & others
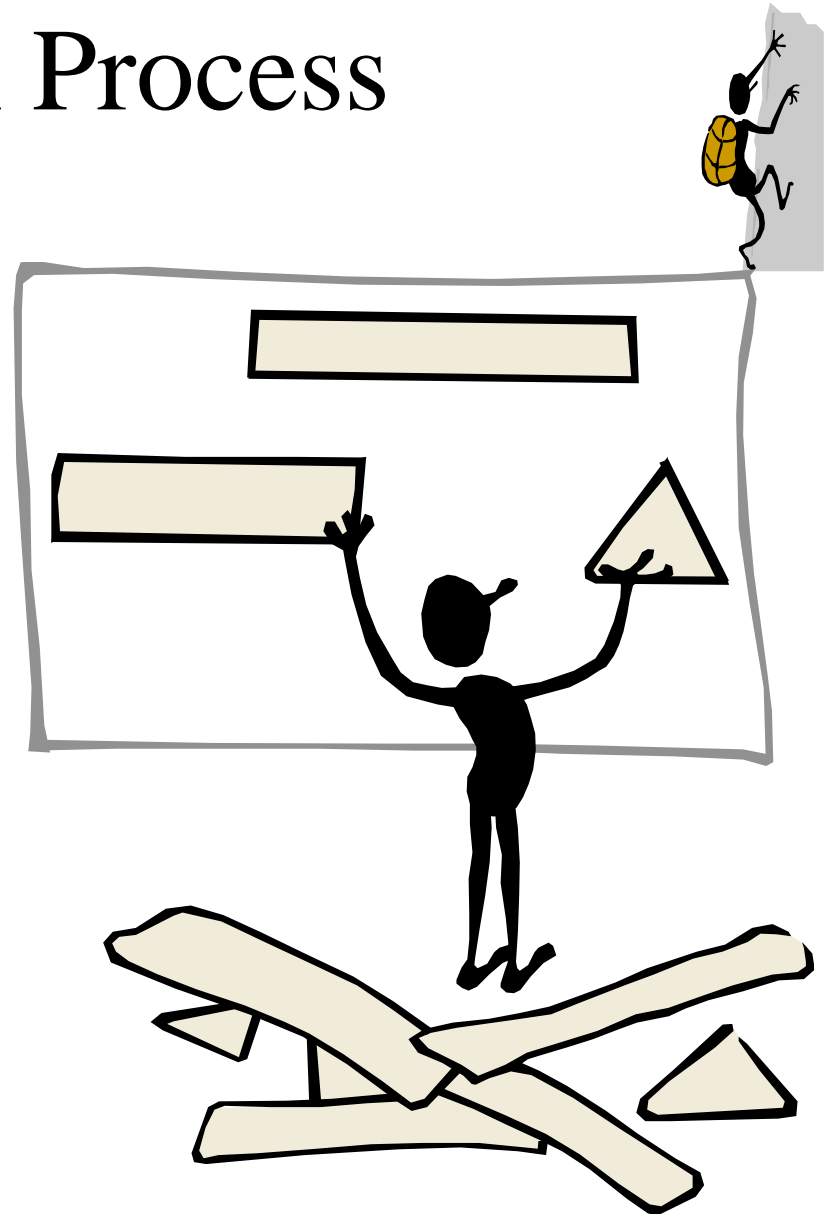
Reading for SD Knowledge

- ## System 1 (Kauffman, 1980)

  - Scheduled for prior to first class thru week 2

  - Provided foundation to build upon

  - Helped students learn systems terminology, concepts and behaviors

  - Considered effective learning resource

 - Experienced students even reported Aha!

# Viewing & Discussing CD-Rom

- Systems Thinking Taking the Next Step
  - Provides effective learning using interactive video, role playing and case studies
  - Uses real life experiences to teach and illustrate systems thinking fundamentals
  - Builds learning in incremental steps
  - Demonstrates simulation and identifies intervention points and strategies
  - Keeps student interest - groups & individuals

Playing the Beer Game
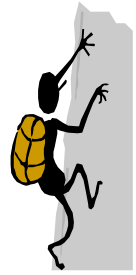
- Students found the Beer Game experience
  - Was an effective group learning time
  - Helped them to appreciate the effects of delays
  - Reported that they learned from their actions
  - Helped them to reflect on and to understand organizational problems where the lack of communication or isolation was a causal force
  - Gave them real world roles in a complex system and helped them to reflected on many organizational problems
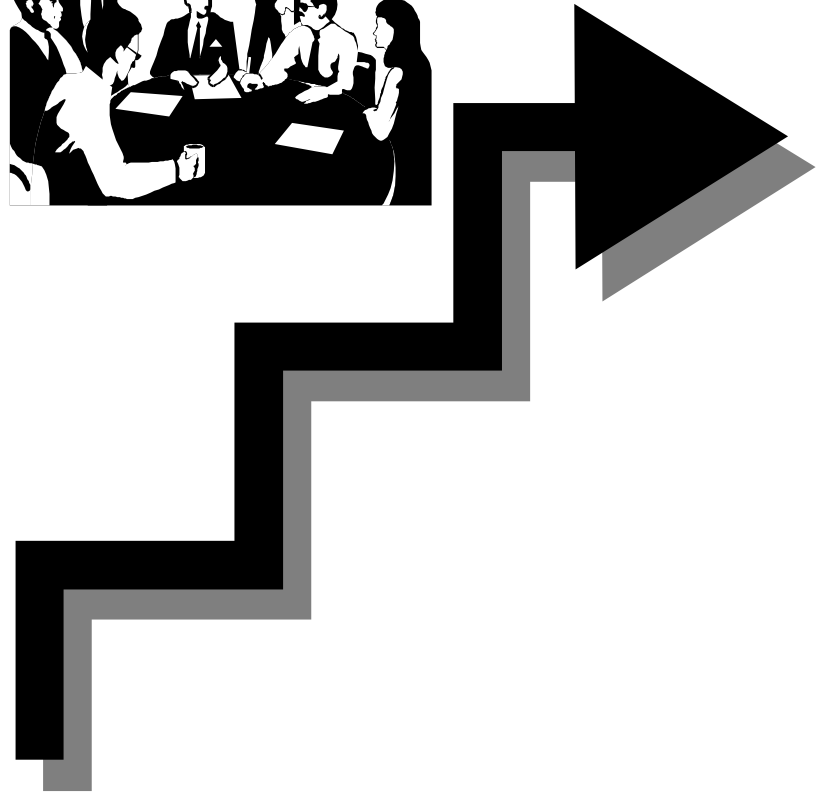
Integrating SD with MSM
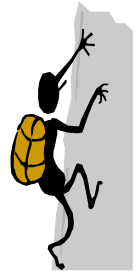
- Management System Model (MSM) examines culture, structures, strategies, policies, and leadership as systemic forces

– Integrating System Dynamics with this model

- enhances their understanding of systemic forces

- enriches their experience with & knowledge of applying System Dynamics
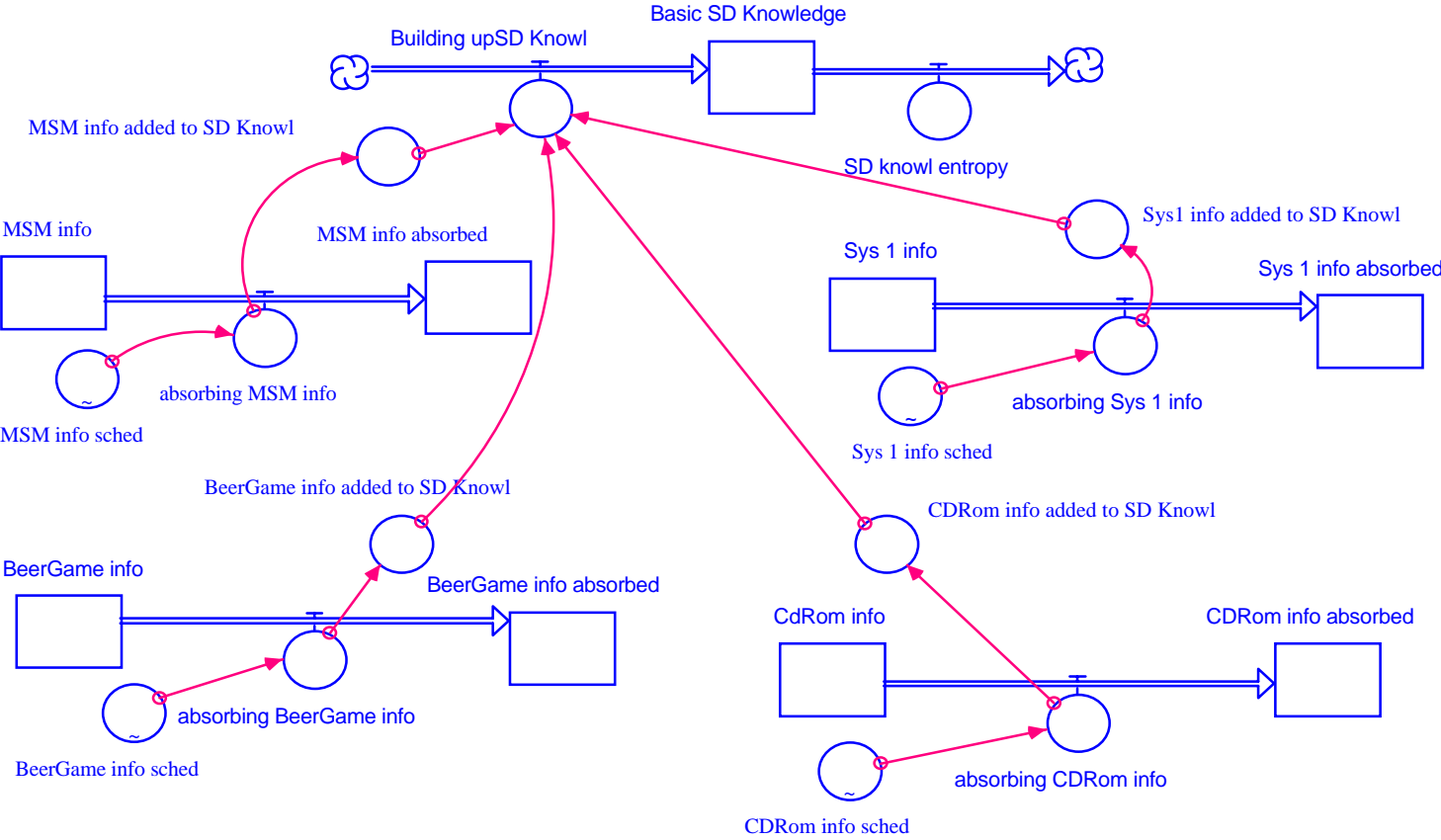
- integrates their own organizational knowledge from multiple perspectives
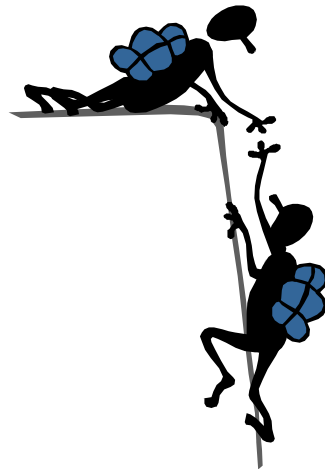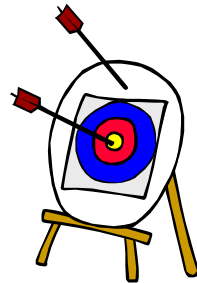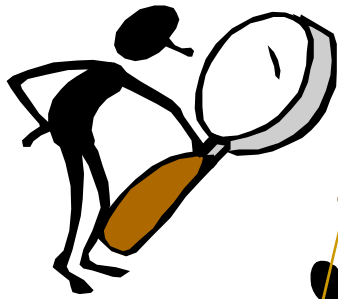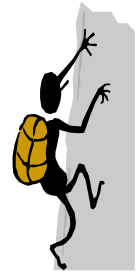
Knowledge was built over time

- SD Knowledge was built over time from
- Reading & Discussing
- Viewing & Discussing
- Playing & Reflecting
- Applying & Sharing different perceptions and organizational directions

Building up basic SD Know-how

Basic SD Knowledge

Building upSD Knowl

MSM info added to SD Knowl

SD knowl entropy

MSM info

MSM info absorbed

Sys1 info added to SD Knowl

Sys 1 info

Sys 1 info absorbed

absorbing MSM info

MSM info sched

absorbing Sys 1 info

Sys 1 info sched

BeerGame info added to SD Knowl

CDRom info added to SD Knowl

BeerGame info

BeerGame info absorbed

CdRom info

CDRom info absorbed

absorbing BeerGame info

absorbing CDRom info

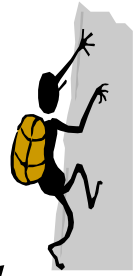BeerGame info sched

CDRom info sched

Conclusions

- Learning in F2F, online, team & alone
- Reading System 1
- Viewing CD-Rom
- Playing Beer Game
- Working to integrate SD with other management models
- Building experience & know-how

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