

A Pedagogical Device for Building Experiential Memory and Motivation for Formal System Modeling

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Overview

- * System Modeling
- * Pedagogical Device Design
- * Learning Objectives
- * Learning Device
- * The Tinkertoy® Exercise
- * Summary

System Modeling

- * SA&D is at the core of IS and IS Education
- * Modeling is at the core of SA&D
- * It is the key to stakeholder communication
 - * requirements, feasibility, analysis, design, testing, documentation, support
- * Students don't find formal modeling easy!

The Need for a Pedagogical Device

- * Two primary obstacles to teaching modeling
 - * the problem being modeled
 - * the modeling abstractions and syntax
- * If attacked in a single course that course must motivate, be effective and be efficient (“no student left behind!”)

Pedagogical Device Design (structure)

- * Fit the opportunity
 - * early - introduction to modeling
 - * terse - fit a single class period
 - * physical and visual - participation with objects
 - * sustain persistent recollection - deliver impact
 - * appear intuitively obvious - feel like a game

Pedagogical Device Design (behavior)

- * Metaphor Casting Potential

- * events and actions portend the formal aspects of modeling ahead

- * the metaphor

- “selects, emphasizes, suppresses, and organizes features of the principal subject by implying statements about it that normally apply to the subsidiary subject”(Black 1962)

Learning Objectives

- * **Model the primary communication aspects of the analysis and design task**
 - * **Identification - “naming”**
 - * **Description - creating shared experience**
 - * **Explanation - normalizing expression**
 - * **Communication - clarity, conciseness, completeness, consistency**

Learning Device

- * Tinkertoy® construction experience
- * Build a series of “abstract assemblies”
 - * guide - provides building instructions
 - * builder - builds by assembling parts
 - * judge - reports result correctness
- * Manipulate the task: structure / behavior

The Tinkertoy® Exercise

- * Vary the clarity of the requirement
 - * image clarity, perspective
- * Vary the communication constraints
 - * who may speak and when
- * Vary the domain knowledge
 - * provide partial vocabularies
- * Manipulate feasibility

Summary

- * “Active Learning” is invigorating
- * Student naturally discover several design principles
- * The experience is extensible
 - * part design, dynamic issues, modularization, componentization, reuse, etc.
- * The experience can be “cast forward” throughout the course
- * This only “scratches” the surface