



Reflections and Insights on System Dynamics Pedagogy

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INTRODUCTION

- **Significance of Teaching SD:** Effective SD education equips students to tackle complex societal challenges beyond traditional static methods (Forrester, 1993).
- **Diverse Educational Approaches:** SD is taught through self-learning, formal programs, and workshops, and both instructor impressions and impacts are crucial (Barlas, 1974).
- **Barriers to SD Adoption:** Despite strong foundations, SD's inclusion in curricula is limited, needing interdisciplinary courses to build shared knowledge (Barlas, 1993; Hovmand & O'Sullivan, 2008).
- **Essential Skills for Dynamicists:** Effective system dynamicists need diverse skills, requiring comprehensive and iterative educational methods (Hovmand & O'Sullivan, 2008).
- **Impact of Teaching Styles:** Instructors' mental models and methods significantly affect student engagement and learning in SD (Forrester, 1993).

METHODS

- **Study Design:** Semi-structured interviews with five SD educators from a Midwestern university, focusing on their teaching mental models.
- **Data Collection and Analysis:** Zoom for recorded interviews; created Causal Loop Diagrams (CLDs) from the data, iterated amongst the authors.
- **Validation and Synthesis:** Participants validated CLDs, which were then synthesized into a comprehensive model reflecting shared and unique insights.

	Participant 1	Participant 2	Participant 3	Participant 4	Participant 5
Practicing SD	4 years	6 years	15 years	29 years	10 years
Teaching SD	1 year	4 years	14 years	20 years	2 years
Estimated Students Taught	30 students	90 students	700 students	>1000 students	30 students
Classroom Level	Masters and PhD	Undergraduate, Masters, PhD	Undergraduate, Masters, PhD	Undergraduate, Masters, PhD	Undergraduate, PhD
Teaching Role	Assistant Teacher	Assistant and Principal Teacher	Principal Teacher	Principal Teacher	Assistant and Principal Teacher

RESULTS

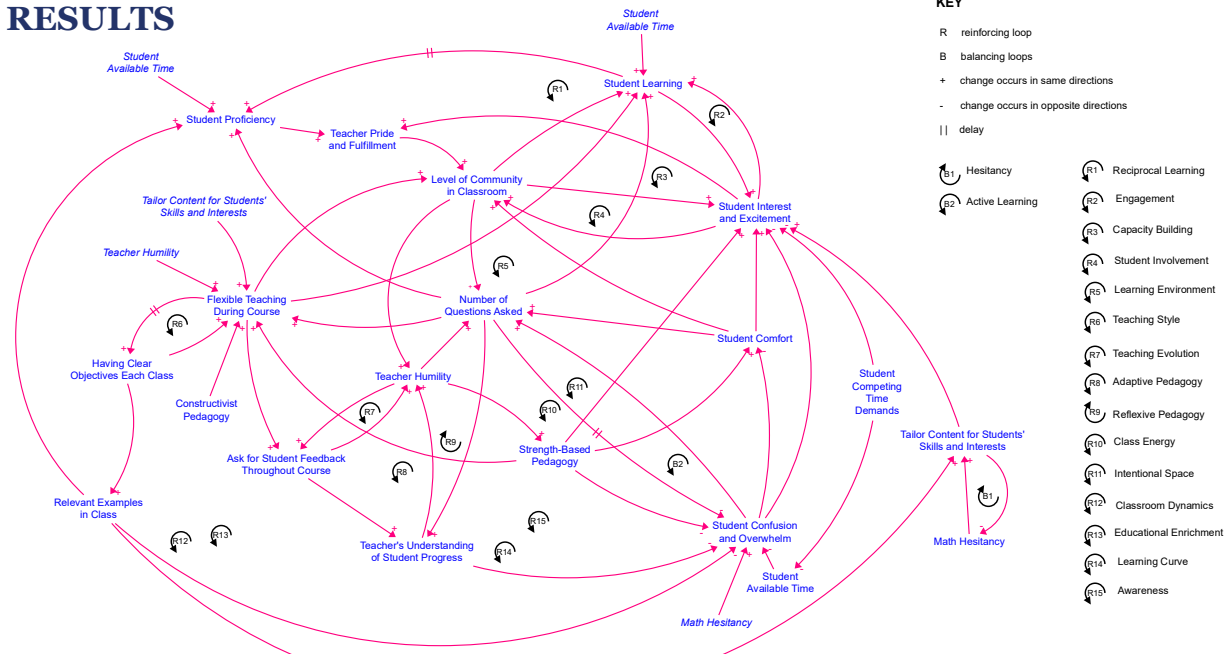


Figure 1. Synthesized causal loop diagram created from all five interviews.

DISCUSSION

- **Strength-Based Teaching:** Emphasis on constructivism and compassion fosters student empowerment and engagement, ultimately enhancing retention in SD.
- **Hands-On Learning:** Repeated SD modelling boosts student skills and interest, reinforcing engagement and understanding.
- **Math Hesitancy:** Tailoring content to student skill levels helps reduce barriers and decrease math hesitancy in learning.
- **Adaptive Teaching:** Flexibility in teaching styles and connecting SD to real-life examples enhance engagement.
- **Barriers to Learning:** Student time demands, math hesitancy, and confusion, which impact learning and retention in SD courses.
- **Effective Teaching Practices:** Clear objectives, repeated examples, and adaptive teaching strategies create a supportive learning environment, fostering long-term retention and student interest.

