

Self-paced, assessment based learning (SPABL) in the mathematics classroom

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“Individual differences” in learners is a fact that can be demonstrated in many ways. That our students vary in many ways can never be forgotten ... Our basic task in education is to find strategies which will take individual differences into consideration but which will do so in such a way as to promote the fullest development of the individual.

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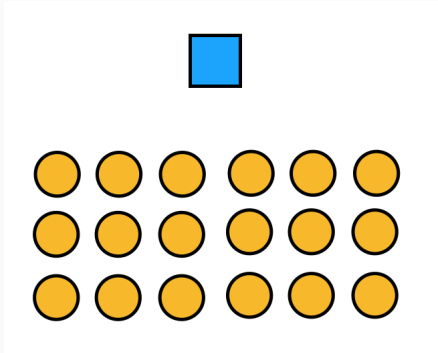
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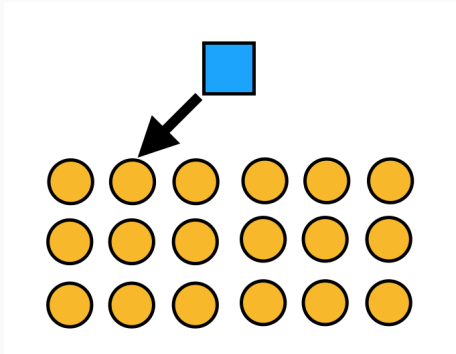
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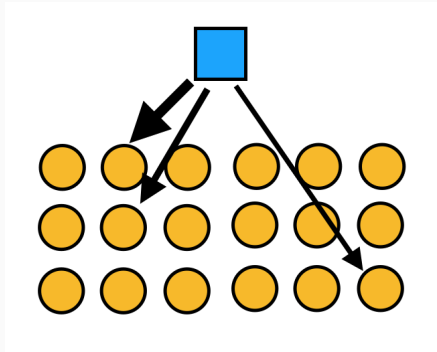
- Faculty to student ratio $\approx 1 : 20$

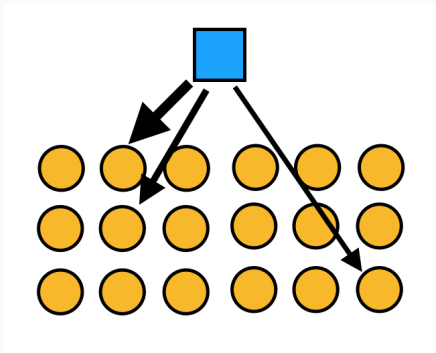
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- Generalized instruction, individualized assessment
- Common end goal









No arrow backwards.

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- "Feedback, correction, enrichment"
- Repeated assessment, use of TA's

Mastery learning

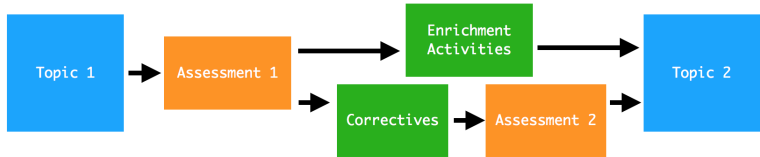


Figure 1: Flow chart of typical mastery learning process.

Mastery learning - success in the classroom

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- Closing achievement gaps

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- Self-efficacy (feeling of being capable of independent success)

Mastery learning - success in the classroom

- Closing achievement gaps
- Self-efficacy (feeling of being capable of independent success)
- Enhanced student-teacher relationships

Mastery learning - problems and challenges

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- Time-constraints
- Demand for more resources
- Necessary cuts made to curriculum
- Less focus on deeper processing of information or applications

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Direction - Modified mastery learning in mathematics

- Keeping the pros of ML, reducing cons

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- Considerations:

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- Keeping the pros of ML, reducing cons
- Considerations:
 - subject, type of class, size of class
 - existence of an honor code, TA's, other resources
 - amount of instructor effort
 - assessment

SPABL - Implementation

- subject, type of class, size of class
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- accurate assessment of students' understanding

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- subject, type of class, size of class → introductory math (core math), 20-25 students
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Math 40 Experiment

- Simple implementation of SPABL, A/B testing under same professor with the same material
- Students in section A - regular midterm/exam
- Students in section B - multiple take-home quizzes with multiple retries without penalty

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- Perceived student sentiment is generally positive
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- Currently lacks method of measuring retention beyond Math 40 (in 65, 70, etc.)

- Literature review of other types of learning (flipped, group based, inquiry based, etc.)
- Understanding and mapping the landscape of mathematics education in college / undergraduate institutes
- Structuring and further editing SPABL based on Math 40 experiment results to cater other courses and/or other college environments

Thank you!

Questions?