

## A Corequisite Course Model for Developmental Mathematics



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Developmental education in Texas
Problems implementing a new model
MSU's model and plan
Results
Future directions and questions



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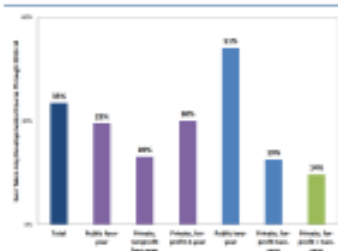
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## Developmental Education by Institution

U.S. Department of Education. Developmental Education: Challenges and Strategies for Reform. January 2017. <https://www2.ed.gov/about/offices/list/opepd/education-strategies.pdf>



- Higher total rates for:
- Hispanic students (58%)
  - Black students (57%)
  - Pell grant recipients (39%)
  - First generation college students (40%)

U. S. Department of Education. Developmental Education: Challenges and Strategies for Reform. January 2017. <https://www2.ed.gov/about/offices/list/opepd/education-strategies.pdf>



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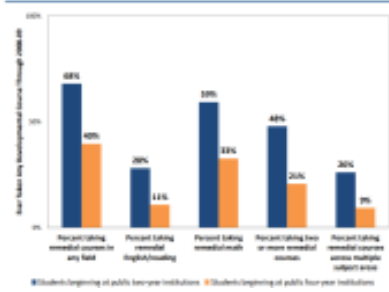
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## Developmental Education by Subject

Exhibit 2: Developmental Course-taking Among 2003-04 Beginning Postsecondary Students at Public Institutions, by Subject Matter from 2003 through 2008



U. S. Department of Education. Developmental Education: Challenges and Strategies for Reform. January 2017. <https://www2.ed.gov/about/offices/list/opepd/education-strategies.pdf>




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## Developmental Education and bachelor's degree completion

Status	No degree, not enrolled	No degree still enrolled	Bachelor's degree
No developmental courses required	19%	10%	67%
Completed <u>all</u> developmental courses	22%	16%	55%
Completed <u>some</u> developmental courses	34%	24%	33%
Completed <u>no</u> developmental courses	44%	17%	30%

Figures include students who took developmental courses within six years of enrollment. U. S. Department of Education. Developmental Education: Challenges and Strategies for Reform. January 2017. <https://www2.ed.gov/about/offices/list/opepd/education-strategies.pdf>




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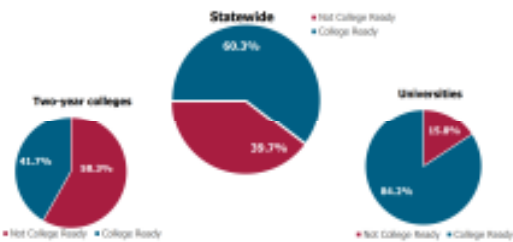
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## Developmental Education needs in Texas



NOTE: "College-readiness" defined as 70% likelihood of achieving a grade of A, B, or C in an entry-level college-credit course

Data from Fall 2019 T3ams Meeting Presentation "TSI and DE Clarifications and Updates" Keylan Morgan, M.Ed Program Specialist, Developmental Education, Division of College Readiness and Success, Central Texas College




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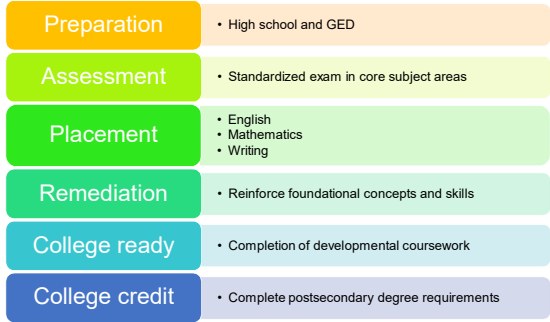
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### Traditional path to college readiness



U. S. Department of Education, Developmental Education: Challenges and Strategies for Reform, January 2017.  
<https://www2.ed.gov/about/offices/list/opepd/education-strategies.pdf>

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### HB 2223 (85<sup>th</sup> Texas Legislature, Regular Session, 2017)

- Requires that each Texas public institution of higher education ensure a certain percentage of its students enrolled in developmental education be enrolled in co-requisite models.
- Phase-in process for corequisite model
  - Fall 2018: 25% of students
  - Fall 2019: 50% of students
  - Fall 2020: 75% of students
- Noncompliance can result in withholding or repayment of formula funding
- DE hours eligible for funding reduced at Universities from 18 hours to 9 hours, CC from 27 hours to 18




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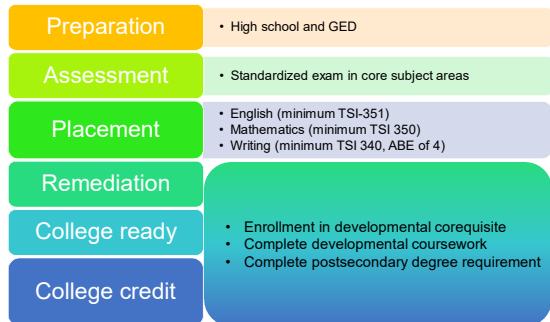
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### HB 2223 requirements for DE in Texas




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## Expectations of HB 2223

- *“House Bill 2223....was signed....to accelerate underprepared students’ persistence and successful completions”*
- Hypothesis:
  - Students will be more successfully complete a developmental corequisite, compared to sequential. (Completion)
- Hypothesis:
  - Students will have greater persistence under a developmental corequisite model, compared to sequential. (Retention)

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## Support for implementation

- Statewide
  - Workshops (Dana Center)
  - Webinars (from state, info on HB2223)
  - The Texas Corequisite Project
  - Grants programs from THECB
- Institutional
  - Registrar’s office provides information on student TSI
  - Departments responsible for defining and meeting state mandate
  - Corequisites submitted for curriculum approval process
  - Dean’s offices helped cross-university communication among colleges



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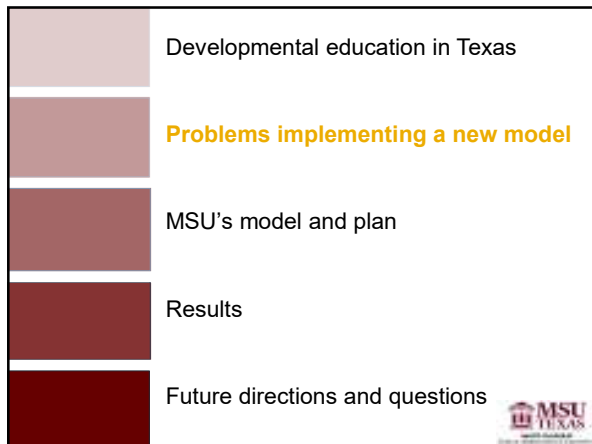
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## Problems implementing a new model

- Algebra vs. non-algebra based course
  - Non-algebra based course satisfies core but not continuation in other math
  - Algebra-based course required for specific programs (business, STEM, education )
- Students need the right math for the right major
- Gaining buy-in among faculty, students and academic advisors
- Technology platforms
  - Some schools using ALEKS, Knewton



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## Goal 1: Advising

- Provide academic counselors across MSU's six undergraduate colleges appropriate core mathematics course placement information.
- Instruct academic counselors to interpret student TSI and other test data.
- Modify degree plans to include the core mathematics course appropriate for each college's degree programs.



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## Advising Flowchart for Fall 2018

Advising for students for whom MATH 1401 satisfies Degree Plan and TIA Math Excess of 800-805.



Note: Students will not be allowed to drop from only MATH 1401, they will be allowed to drop from both courses or MATH 1401, but only during the week prior to the last day for "W" during the semester.

\*Non-course based option - dependent on funding for supplemental instruction and possibly a faculty member to oversee that instruction.

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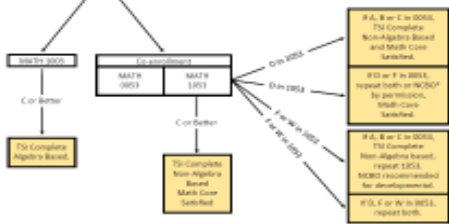
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## Advising Flowchart – Side 2

TIA Math Excess of 800-805.



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## Goal 2: Corequisite model scaling

- Initial one-section pilot, with core course taught by tenure-track faculty member paired with developmental mathematics instructor.
- Analyze data from single-section pilot for scaling to full implementation.
- Modify corequisite for full implementation using pilot data from the pilot.




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### Goal 3: Faculty development

- Add instructor position in mathematics to support corequisite model.
- Coordination among faculty teaching within the corequisite model.




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### Goal 4: Overall institutional needs

- Evaluate capacity for corequisite model
- Evaluate budget and make adjustments as required.
- Expand corequisite courses to meet the projected student population goals of MSU's 2017-2022 strategic plan.




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### Initial corequisite model implementation

Core course	Corequisite course	Pilot	Full implementation	Percent of DM students
MATH1053 Contemporary Math	MATH0053 Developmental Supplement Contemporary Math	Spring 2018	Fall 2018	51.4%
MATH1233 College Algebra	MATH0233 Developmental Supplement College Algebra	Spring 2019	Fall 2019	35.5%
MATH1203 Mathematical Analysis for Business	MATH0203 Developmental Supplement Business Mathematics	Fall 2019	Spring 2020	13.1%




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## Assessment

- Did MSU meet state-mandated enrollment targets?
- How did students perform in the courses?
- How did students taking the corequisite evaluate the experience?
- How did math faculty teaching the corequisite evaluate the experience?
- What resources were required to support the corequisite model?
- Does the new math structure more effectively retain students?



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### Did MSU meet state-mandated enrollment targets?

Semester*	Target (% students in coreq model)	% of MSU developmental math students in coreq
Fall 2018	25%	33%
Spring 2019	25%	33%
Fall 2019	50%	57%
Spring 2020	50%	
Fall 2020	75%	
Spring 2021	75%	

\* MSU did not offer corequisite option in summer




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### How did students perform in the courses?

Population	Percent of developmental students enrolled in coreq	Percent of developmental math students completing core math in Year 1
Statewide, prior to HB 2223	0%	33%
MSU, prior to HB 2223	0%	10%
MSU, Year 1 of coreq	25%	45.2% (132* out of 292 new students)

\* An additional 50 students are TSI complete and are still completing core math, which will bring to 182 (62.3%)




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### How did students taking the corequisite evaluate the experience?

- Teaching evaluations for Contemporary Math and coreq
  - Instructor:  $\bar{x}$  = 4.621 out of 5.0 (range 4.34 to 4.72)
  - Overall :  $\bar{x}$  = 4.623 out of 5.0 (range 4.29 to 4.85)
- Student comments overwhelmingly positive
- Negative comments were few (1 out of 10 comments submitted)
- General comments:
  - "Professor did an amazing job. I actually learned math for the first time in my life."
  - "I've never enjoyed math before but this is my favorite class"
  - "Math has always been confusing and the class helped massively"




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### How did students taking the corequisite evaluate the experience?

- Student comments—on having two classes:
  - “I loved both classes, I felt that the 0053 helped me tremendously.
  - “Having both classes really helped me work on the things I struggled with”
  - “Having both the classes helped me because I got extra help with what we were learning”
  - “Having the supplementary course was extremely helpful and the course was easy. I loved the material; it challenged our minds but it was easy at the same time.”
  - “Having the 2 classes was really helpful”
  - “Having 2 math classes was much simpler!”



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### How did students taking the corequisite evaluate the experience?

- Student comments—on having class 5 days/week:
  - “I think the five days a week was amazing. Really helpful”
  - “I loved the 5 day a week. I felt that if we were behind it was easier to review/go over more. I felt that we went at our own place and it was very nice!”
  - “Coming to class 5 days a week helped me”
  - “The 5 days per week helped with remembering what you did the day before although it can be tedious.”
  - “This class was great!! I didn’t mind having it 5 days a week.”
  - “The fact that we had to attend 5 days a week, it was hard but at least I was able to learn better.”
  - “I loved having math 5 days a week! It really helped me.”

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### How did math faculty teaching the corequisite evaluate the experience?

**From a DM instructor:** While the corequisite model is a lot of work, student work ethic overall appears better. Students appear to be more motivated to get their core math course complete.

**Challenges:**

- Students have varied backgrounds.
- Some students bring bad habits with them from high school, which can then turn into 6 hours of F or W.
- By midterm, students are getting tired of being in math every day.



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## Does the new math structure more effectively retain students?

To be determined. Currently only Fall 2018 to Fall 2019 retention available.




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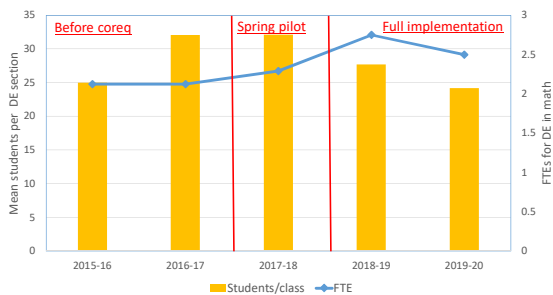
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## What resources were required to support the corequisite model?




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### Goal 4: Overall institutional needs

- Evaluate capacity for the corequisite model for projected student population
- Evaluate budget and make adjustments as required.
- Expand corequisite course offerings to meet the projected student population goals of MSU's 2017-2022 strategic plan.

Using DegreeWorks and AdAstra to evaluate capacity university-wide and predict course/section needs.

Dean is serving on Strategic Enrollment committee to identify growth areas and needs for the future.



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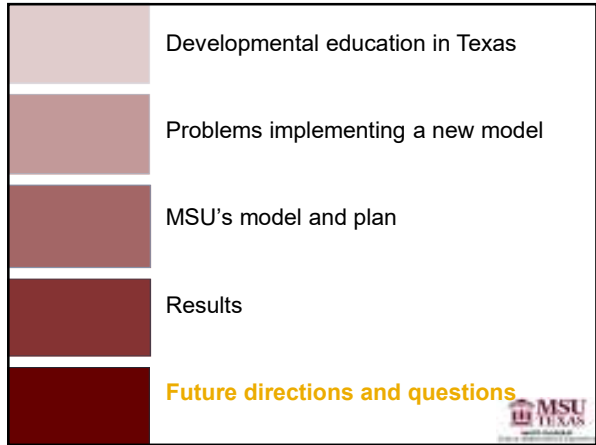
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### Issues for the future

- Credit hours for corequisite
- Grading for corequisite
  - Letter grade
  - Pass/Fail
- Changing major and meeting math requirement
  - Algebra versus non-algebra based courses
- Statewide comparison across institutions
  - Challenges of a corequisite mandate but no statewide model
- Pricing of developmental education



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