Transitional Math in Illinois: A Quantitative Study on Eligible and Enrolled Students

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Hello!

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Improved College Attainment: Illinois Transitional Math

College Enrollment

- College enrollment over the last quarter century has increased to meet the demands of a job market (Balfanz et al., 2016)
- By 2020, 65 percent of all jobs in the United States will require post-secondary education and training, a dramatic increase from 28% in 1983 (Carnevale, Smith, & Strohl, 2013).
- From 1995 to 2005, 17 million service-sector jobs requiring a college degree were created, and over 3 million jobs in manufacturing were lost (Partnership for 21st Century Skills, 2008)

Barriers to Access and Attainment

On and Off Ramp to Success

Barriers to Access and Attainment- Leaks in the Pipeline

The Human Capital Theory illustrates how education is the investment people make in themselves. In a time when a bachelor's degree earns on average over $800,000 more in a lifetime income than those with only a high school diploma, we are also seeing an overall slowdown in post-secondary attainment (Daly & Bengali, 2014)

Although there is increasing attention turning to college completion rather than college access alone, improving college access remains among the most promising strategies for raising overall degree attainment (Page & Scott-Clayton, 2015). Barriers:

- Financial
- Geographical
- Discrimination
- Social Capital
- Under-prepared

Solutions to Barriers- Remedial Education

Remedial or Developmental Education: Required courses used to strengthen academic skills in order to prepare students for college-level coursework

You can also split your content

College -Readiness

The national college-ready rate for graduates, using all four benchmarks (English, Math, Reading and Science), was 23 percent in 2009. This figure reflects a decrease of 1 percent from 2008, signaling that the problem may be getting worse (Barnes, 2010)

Underprepared Students

When students arrive at college and are identified as unprepared they are often required to take developmental or remedial education coursework.

Students who begin their college career in developmental courses are significantly less likely to earn a degree (Attewell, Lavin, Domina, & Levey, 2006).

Transitional Math Illinois

Curriculum

These courses are, learning modules, or online tutorials developed together by secondary and postsecondary faculty typically offered no later than 12th grade to students at risk of being placed into developmental math or English in college (Barnett, Chavarin & Griffin, 2018).

College Placement

Students to successfully complete transitional courses while in high school therefore avoiding placement into remedial courses in college.

Illinois PWR Act

Currently, thirty-nine states offer transition curricula in math (Barnett, Chavarin & Griffin, 2018).

Illinois Post-Workforce Readiness Act Passed in 2016 includes Transitional Math

Research Questions

1. What are the demographic characteristics of students eligible for Transitional Math?

1. What are the demographic characteristics of students enrolled in Transitional Math, generally?
    a. What are the characteristics of students enrolled in each of the Transitional Math Pathways?
    b. What if any differences exist amongst the pathways?

1. How does the eligible population compare to the enrolled population by demographic characteristics?

Desired Outcomes

- Contribute early research on Transitional Math in Illinois
- Highlight patterns of enrollment and success
- Engage in conversation with professionals implementing Transitional Math across the state
- Provide districts with recommendations for enrollment and promotional information

Sample- Waubonsee Community College Network High Schools

Table 1. Schools in network Population Racial/Ethnic Diversity

School	Student Population	White	Hispanic	Black	Asian	Other
1	**3700**	**30%**	**60%**	**10%**	**<10%**	**<10%**
2	4000	<10%	90%	10%	<10%	<10%
3	2700	60%	15%	10%	10%	5%
4	2800	60%	20%	10%	5%	5%
5	**1300**	**80%**	**10%**	**<10%**	**<10%**	**10%**
6	2000	80%	10%	5%	<10%	5%
7	**1900**	**85%**	**10%**	**<10%**	**<10%**	**5%**
8	200	90%	10%	<10%	<10%	<10%
9	300	95%	5%	<10%	<10%	<10%
10	100	80%	20%	<10%	<10%	<10%
11	700	80%	20%	<10%	<10%	<10%
12	**800**	**40%**	**50%**	**10%**	**<10%**	**<10%**
13	**1900**	**70%**	**20%**	**10%**	**<10%**	**<10%**

Note. Percentages rounded to the nearest tenth percent.

**Schools used in sample are in bold

Table 1. Schools in network Population Racial/Ethnic Diversity

School	Student Population	White	Hispanic	Black	Asian	Other
1	**3700**	**30%**	**60%**	**10%**	**<10%**	**<10%**
5	**1300**	**80%**	**10%**	**<10%**	**<10%**	**10%**
7	**1900**	**85%**	**10%**	**<10%**	**<10%**	**5%**
12	**800**	**40%**	**50%**	**10%**	**<10%**	**<10%**
13	**1900**	**70%**	**20%**	**10%**	**<10%**	**<10%**

Research Question #1:

What are the demographic characteristics of students eligible for Transitional Math?

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Table 3. Demographic characteristics of students in sample

	Total	% or mean
Female	1,203	49.53%
Male	1,226	50.47%
White	1,429	58.83%
Black/African American	142	5.85%
Hispanic/Latinx	697	28.69%
Asian	92	3.79%
Other	69	2.84%
IEP	102	4.20%
ED	535	22.03%
EL	119	4.90%
SAT Score (mean)	2429	522.48
Total	2429	

Research Question #1:
What are the demographic characteristics of students eligible for Transitional Math?

Overall sample: 2429 students

Largest Demographic groups:

- 50% White
- 29% Hispanic/Latinx
- 22% Low Income (ED)

Low Income and Hispanic/Latinx students disproportionately represent students in remedial education at Community Colleges. (Sugar, baumgardner, Raymond, Moore, Davidson, & Denham, 2012)

Eligible students :1,234 students or 50% of overall population

(Eligible defined as senior status and <530 on the SAT)

Largest Demographic groups:

- Hispanic/Latinx: 40%
- Low Income: 33%

T-test for difference between Eligible and Not Eligible:

- White -30%
- Hispanic/Latinx: 26%
- Low Income: 24%

Research Question #1:
What are the demographic characteristics of students eligible for Transitional Math?

- Hispanic/Latinx and Low Income students are disproportionately eligible for Transitional Math.
  - Hispanic/Latinx: 498 students or 45% of eligible students
  - Low Income: 405 students or 33% or eligible students
- This is consistent with current research on remedial education enrollment.
- Key group to watch: 90 students with an IEP in sample. 87 students with an IEP are eligible.

Research Question #2

What are the demographic characteristics of students enrolled in Transitional math? Each pathway? Are there differences by pathway?

Research Question #1:

Focus Group Questions: In your small groups, engage in the questions below. Use the graphic organizer to record your thoughts.

1. Around 50% of the overall population of the study was eligible for Transitional Math.
    a. Does this number surprise you?
    b. How does this number affect the way we think about the need for Transitional Math programming?
2. 87 of the 90 students with an IEP are eligible for Transitional Math.
    a. How ready are schools to support students in an IEP in Transitional Math
    b. What additional considerations should be made for students with an IEP in Transitional Math?
3. Hispanic/Latinx and Low Income students are disproportionately eligible for Transitional Math. This is consistent with current research on remedial education enrollment.
    a. How has Transitional Math provided additional access to post-secondary enrollment for students in your schools?
    b. How does this trend help us plan for education materials for students and parents regarding Transitional Math?

Research Question #2
What are the demographic characteristics of students enrolled in Transitional math? Each pathway? Are there differences by pathway?

Table 4. Demographic Characteristics of Students, by Transitional Math Eligibility

	TM eligible[c] students		Non-TM eligible students		Two-tailed T-test for differences between eligible and not-eligible	
	Number	*% or mean*	*Number*	*% or mean*	*Mean difference*	*p-value*
Female	652	52.84%	526	45.90%	**6.94%**	**0.0007**
Male	582	47.16%	620	54.10%	**-6.94%**	**0.0007**
White	557	45.14%	867	75.65%	**-30.52%**	**0.0000**
Black/African American	119	9.64%	17	1.48%	**8.16%**	**0.0000**
Hispanic/Latinx	498	40.36%	165	14.40%	**25.96%**	**0.0000**
Asian	23	1.86%	66	5.76%	**-3.90%**	**0.0000**
Other	37	3.00%	31	2.71%	0.29%	0.6680
IEP[a,b]	90	7.29%	7	0.61%	**6.68%**	**0.0000**
Low Income[a,b]	408	33.06%	103	8.99%	**24.08%**	**0.0000**
EL[a,b]	105	8.51%	2	0.17%	**8.33%**	**0.0000**
SAT score (mean)	1234	439.42	1146	611.93	**-172.51**	**0.0000**
Total	1234	50.80%	1146	47.18%		

Note: Bold mean differences and p-values indicate statistical signficance at the $p < .05$ level.

[a] Observations for TM eligible students are less than the overall sample total due to missing data. Only 1016 students had information about IEP, 1184 students had information indicating low-income, and 1143 had records related to EL status.

[b] Observations for TM eligible students are less than the overall sample total due to missing data. Only 1016 students had information about IEP, 1184 students had information indicating low-income, and 1143 had records related to EL status.

[c] TM Eligible is defined as students with senior status and have an SAT score below College and Career Readiness benchmark of 530 as outlined in the PWR Act Transitional math Competencies and Policies (2018).

Research Question #2
What are the demographic characteristics of students enrolled in Transitional math? Each pathway? Are there differences by pathway?

- 410 students enrolled in Transitional Math- 16% of the overall population.
- 71 students enrolled but did not meet the criteria <530 on the SAT
  - Enrollment based on other factors i.e. teacher or counselor recommendation.
  - Schools needing to fill sections
- Largest Demographic populations enrolled:
  - Hispanic/Latinx: 53%
  - Low Income: 41%
- Only 15 students with an IEP enrolled out of 90 eligible

Research Question #2
What are the demographic characteristics of students enrolled in Transitional math? Each pathway? Are there differences by pathway?

Table 6. Demographics of student enrolled in STEM Pathway and Quantitative Literacy/Stats Pathway (only TM Eligible students)

	TM Enrolled students		Students in STEM Pathway		Students in QL pathway		% Difference by pathway	
	Number	%	Number	%	Number	%	Difference	p-value
Female	180	53.10%	71	52.21%	109	53.69%	-1.49%	0.7885
Male	159	46.90%	65	47.79%	94	46.31%	1.49%	0.7885
White	106	31.27%	23	16.91%	83	40.89%	**-23.97%**	**0**
Black/African American	40	11.80%	16	11.76%	24	11.82%	-0.06%	0.9871
Hispanic/Latinx	177	52.21%	92	67.65%	85	41.87%	**25.78%**	**0**
Asian	6	1.77%	4	2.94%	2	0.99%	1.96%	0.1817
Other	10	2.95%	1	0.74%	9	4.43%	**-3.70%**	**0.0487**
IEP[a]	15	4.44%	4	2.94%	11	5.45%	-2.50%	0.2743
Ed[a]	136	42.77%	63	46.32%	73	40.11%	6.21%	0.2693
El[a]	35	11.82%	19	13.97%	16	10.00%	3.97%	0.2933
SAT score[a]	339	441.65	136	430.74	203	448.97	**-18.23**	**0.0008**
Total	339		136		203			

Research Question #2
What are the demographic characteristics of students enrolled in Transitional math? Each pathway? Are there differences by pathway?

- Only STEM and QL pathway represented in the sample
- Demographic trends
  - STEM students are more likely to be Hispanic/Latinx than white
  - Students in QL pathway are more likely to be Low Income

- The average SAT for QL pathway is higher than the average for the STEM pathway by 18 points.
  - Surprising based on placement criteria
  - No clear explanation but important to make schools aware.

Research Question #2:

Focus Group Questions: In your small groups, engage in the questions below. Use the graphic organizer to record your thoughts.

1. 16% of the overall population of student in the sample enrolled in Transitional math.
    a. What courses did students not take in order to take this course?
    b. Are these students that were not engaged in a 4yr of math previously?
2. Largest demographic groups include Hispanic/Latinx and Low Income students. How does this enrollment adjust their access to post-secondary degree completion?
3. What does the average SAT score tell us about placement into the STEM and QL pathway?
    a. This is surprising based on placement criteria/recommendation. How would you explain this data?
4. Students enrolled in Transitional Math that did not meet eligibility as defined by this study <530 on the SAT.
    a. Do these enrollments surprise you?
    b. How does the enrollment process look like in your district?

Research Question #3

How does the eligible population compared to the enrolled population by demographic characteristics?

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Table 7. Comparing TM eligible students to TM Enrolled students

	TM eligible students		TM eligible and Enrolled students		TM eligible and not enrolled students		% Difference between eligible and enrolled	
	Number	%	Number	%	Number	%	Difference	P-value
Female	652	52.84%	180	53.10%	472	52.74%	0.36%	0.9101
Male	582	47.16%	159	46.90%	423	47.26%	-0.36%	0.9101
White	557	45.14%	106	31.27%	451	50.39%	**-19.12%**	**0**
Black/African American	119	9.64%	40	11.80%	79	8.83%	2.97%	0.1145
Hispanic/Latinx	498	40.36%	177	52.21%	321	35.87%	**16.35%**	**0**
Asian	23	1.86%	6	1.77%	17	1.90%	-0.13%	0.8807
Other	37	3.00%	10	2.95%	27	3.02%	-0.07%	0.951
IEP	90	7.29%	15	4.44%	75	8.38%	**-3.94%**	**0.0005**
Low income	408	33.06%	136	42.77%	272	30.39%	**12.38%**	**0.0003**
EL	105	8.51%	35	11.82%	70	7.82%	4.00%	0.068
SAT score	1,234	439.42	339	441.65	895	438.57	3.08	0.4332
Total	1,234		339		895			

Research Question #2
What are the demographic characteristics of students enrolled in Transitional math? Each pathway? Are there differences by pathway?

- Eligible students enrolled at a rate of 27% (Less missing data)
- White students are less likely to enroll in Transitional Math when eligible, while Hispanic/Latinx students are more likely to enroll.
  - 106 out of 557 eligible white students enrolled in Transitional Math.
- Students with IEPs are less likely to enroll.
- Emerging English Learners enrolled at a rate of 35% higher than the overall enrollment rate of 27%

Research Question #3:

Focus Group Questions: In your small groups, engage in the questions below. Use the graphic organizer to record your thoughts.

1. Eligible students enrolled at a rate of 27%.
   a. What classes are they not taking? What does that tell us about enrollment?
   b. Are these students that were not engaged in a 4yr of math previously?
   c. What courses are student not enrolled taking? Higher/lower or not math course?
2. Students with an IEP are less likely to enroll while EL students are more likely. How do you explain this enrollment trend based on your experiences?

Record your notes from the small group discussion

#1: What are the demographic characteristics of students eligible for Transitional Math?

#2: What are the demographic characteristics of students enrolled in Transitional math? Each pathway? Are there differences by pathway?

#3: How does the eligible population compared to the enrolled population by demographic characteristics?

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