

Transitional Math Implementation in Illinois

Investigating Secondary and Postsecondary Implementation and Data Utilization

October 2023



EdSystems

EDUCATION SYSTEMS CENTER at
NORTHERN ILLINOIS UNIVERSITY



NORTHERN ILLINOIS UNIVERSITY

NIU P-20 Research and Data Collaborative

Division of Outreach, Engagement and Regional Development

This study was conducted for Education Systems Center and the primary state agencies overseeing transitional math implementation: Illinois State Board of Education, Illinois Community College Board, and Illinois Board of Higher Education.

AUTHORS

The study was conducted by the following Northern Illinois University team members:

Xiaodan Hu, PhD

Associate Professor
Community College Leadership Program
Coordinator Counseling and Higher Education
College of Education

Benjamin Creed, PhD

Associate Professor
Leadership, Educational Psychology
and Foundations
College of Education

PLEASE CITE THIS REPORT AS:

Hu, X. & Creed, B (2023). Transitional Math Implementation in Illinois: Investigating Secondary and Postsecondary Implementation and Data Utilization. *Northern Illinois University: P-20 Research & Data Collaborative*.



ABOUT EDSYSTEMS

Education Systems Center (EdSystems) is a mission-driven policy development and program implementation center based within Northern Illinois University's Division of Outreach, Engagement, and Regional Development. EdSystems' mission is to shape and strengthen education and workforce systems to advance racial equity and prepare more young people for productive careers and lives in a global economy. Learn more at edsystemsniu.org.



ABOUT P-20 RESEARCH & DATA COLLABORATIVE

The NIU P-20 Research and Data Collaborative brings together offices with deep complementary areas of expertise – the data systems and visualization work of Illinois Interactive Report Cards, the research and communications strengths of the Illinois P-20 Network, the community and economic development work of the Center for Government Studies, the public policy development work of Education Systems Center, and the extraordinarily broad expertise available through the faculty in the College of Education.

Table of Contents

Project Overview	1
Section 1. Introduction	3
Research Questions	3
Data Collection and Analysis	3
Section 2. Findings.....	6
School District Survey Responses Related to Transitional Math Implementation.....	6
Community College Perspectives on Transitional Math Implementation	10
References.....	18
Appendix.....	19
Appendix 1. Survey Protocol for High School Counselors	19
Appendix 2. Semi-Structured Interview Protocol—Transitional Math Implementation in Community Colleges	21
Appendix 3. Semi-Structured Interview Protocol—Transitional Math Data Utilization.....	22

Project Overview

This report covers the findings from an initial evaluation of transitional math in Illinois. The following report focuses on understanding the implementation of transitional math programs in secondary and postsecondary education institutions, a key part of the larger evaluation effort which examines the impact of transitional math programs on participating students. The report also covers a case study of data utilization related to transitional math within one Illinois region.

The Postsecondary and Workforce Readiness (PWR) Act established a new statewide system for transitional instruction in math and English aimed at increasing college readiness for high school seniors and reducing developmental education needs. Community colleges and high schools work in partnership to create policies and courses that incorporate the required competencies of college-level learning. These courses emphasize authentic learning experiences aligned with individual students' future academic and career plans. Successful completion of transitional courses provides students with guaranteed placement into college-level courses at Illinois community colleges and accepting Illinois universities within 18 months after course completion. All school districts in Illinois were expected to implement transitional math instruction by no later than the 2022–23 school year, and a parallel effort is underway to launch transitional English statewide.

With transitional math courses currently in place in some districts across Illinois and under development in others, the larger systematic evaluation of transitional math is well timed to understand how transitional math courses are operating and their impact on students and systems. The evaluation also focuses on identifying areas for improvement, growth, and the sharing of best practices so the program can be improved and outcomes enhanced, particularly for Illinois' most underserved students who disproportionately enroll in developmental courses or experience academic barriers to accessing postsecondary education in Illinois.

In particular, the goals of the evaluation project are to examine:

1. The extent to which transitional math instruction provides students with the mathematical readiness to meet their individualized college and career goals.
2. The extent to which transitional math leads to more Illinois high school graduates placing into, and being successful in, college-level math instruction without the need for remediation.
3. The extent to which transitional math students persist in and earn credit for postsecondary coursework.
4. The extent to which transitional math enhances educational equity in the secondary and postsecondary contexts.

To achieve these goals, the project employed a mixed-methods study design drawing on the following data sources at both the secondary and postsecondary levels: i) newly-collected survey data to understand how transitional math is implemented locally in high schools; ii) semi-structured interviews with community college representatives about implementation of transitional math in community colleges; and iii) semi-structured interviews with school district and community college representatives related to data utilization around transitional math. With the collected data, we conducted multiple sets of analyses focused on the implementation and impact of transitional math, including: i) analysis of closed and open survey responses of how transitional math is implemented within the secondary setting, ii) qualitative analyses of how transitional math is implemented locally in community colleges; and iii) qualitative analysis of how data is being utilized in secondary and postsecondary settings to support understanding of transitional math and related decision-making.

In sum, the above data and analyses allowed for an initial systematic evaluation of the implementation of and data use related to transitional math, offering rigorous evidence to improve and support student success and equity with the secondary-postsecondary collaboration on transitional math across Illinois.

This report focuses on the data collection and analysis activities during 2022 and 2023. This report found:

- **The implementation of transitional math in high schools.**
 - High schools across the state are offering transitional math courses, with Quantitative Literacy and Statistics being the most common.
 - High school counselors consider multiple criteria, inclusive of but not limited to the PWR Act guidance, when determining transitional math course eligibility.
 - Few schools reported tailored supports for students enrolled in transitional math.
 - Opportunities exist to improve high school implementation of transitional math by providing more information to students about transitional math courses and how to access credit-bearing post-secondary courses.
- **The implementation of transitional math in community colleges.**
 - Transitional math programs have mixed impacts on student success and college enrollment.
 - Supporting the partnership between high schools and community colleges is key to improving transitional math program implementation.
 - The choice among transitional math pathways is largely based on the alignment with career pathways and course offerings by community colleges.
 - Despite equity concerns, little targeted support is provided for historically underserved transitional math students.
 - There is a need for additional guidance from the state agencies regarding successfully designing, implementing, and evaluating transitional math.
- **Data utilization case study.**
 - While districts have implemented transitional math and are actively enrolling students in transitional math classes, data utilization lags behind.
 - Secondary administrators defined transitional math success primarily as completion of course and use of use placement waiver.
 - The supports laying the groundwork for transitional math in Illinois were impactful but there is a need for ongoing support related to implementation, data collection, and data analysis.
 - School district administrators had multiple recommendations related to better using data to support students and improve transitional math, including additional state data utilization supports and having access to statewide evidence on transitional math effectiveness.
 - The community college Institutional Research Office staff has limited involvement in data utilization of transitional math-related progress and impact.
 - No formal study or evaluation has been conducted on transitional math by the college due to the lack of data access and personnel capacity.
 - It is the Institutional Research Office's intention and goal to help stakeholders (e.g., students, practitioners, educators) understand, for example, what transitional math is, its impact, and its implications for practices and future research.
 - Institutional Research staff members face challenges in potentially identifying the impact of transitional math programs on student success.

Section 1. Introduction

Research Questions

This report focuses on the results related to the implementation of and data utilization related to transitional math in both high schools and community colleges. The research questions are:

1. Within high schools, how are transitional math pathways being implemented?
 - a. How do schools determine eligibility for transitional math pathways?
 - b. How do schools support student decision-making related to transitional math pathway enrollment?
 - c. What supports were provided to students during and upon completion of transitional math pathways?
2. From the community college perspective, how are transitional math pathways implemented?
 - a. How has transitional math impacted their students and their colleges?
 - b. What has the implementation process of transitional math looked like in their setting?
 - c. What challenges have they encountered?
 - d. What additional supports are needed to improve transitional math implementation?
3. Within a single region, what is the current state of data utilization to support transitional math amongst administrators at both the secondary and postsecondary levels?
 - a. What data is systematically collected to understand transitional math programs?
 - b. How is data analyzed and reported in order to inform transitional math practices or supports?

Data Collection and Analysis

The data for the evaluation project was collected using multiple data collection efforts aligned with the above research questions in order to develop a baseline understanding of transitional math implementation in Illinois. In order to understand high school implementation of transitional math, surveys were administered to high school counselors across Illinois, with a direct outreach effort to Chicago Public Schools (CPS) school counselors. To explore the implementation of transitional math in community colleges, semi-structured interviews were conducted with representatives from these settings. To address the third research question, a single region was selected to understand the state of data utilization. Semi-structured interviews were conducted with two school districts and the in-district community college. Each of these efforts is discussed briefly below.

High School Counselor Survey Data Collection Related to Implementation

We collaborated with the Illinois State Board of Education (ISBE) to email all Illinois high school counselors an invitation to participate in the 15–20 minute survey (Appendix 1). A follow-up email was sent two weeks afterwards. Given the requirements to conduct research within CPS, the researchers worked with CPS' Research Review Board to distribute the survey to all CPS school counselors. The survey asked participants questions about the transitional math courses offered in their building, how eligibility was determined, the materials and information used to guide student enrollment decisions, and what supports were provided to students during and after a transitional math course. In the case that the school counselor was not the right person to answer the survey, email recipients were encouraged to share the survey with the individual with knowledge of transitional math implementation in their school.

In all, 83 individuals responded to the survey representing a variety of positions and years of experience (Table 1), with 10 respondents coming from schools in CPS. Respondents came from a variety of school settings, including from unit and high school districts, from small, medium, and large districts, and across the four evidence-based funding (EBF) tiers.

The goal of the surveys was to provide a descriptive understanding of the current state of high school transitional math implementation in Illinois. As such, the analysis was descriptive in nature, providing primarily frequency data

Table 1. Information on respondents.

	NUMBER	%
Position Title		
Counselor	53	63.86%
Department Chair	3	3.61%
Director	4	4.82%
Principal/Assistant Principal	2	2.4%
Teacher	13	15.66%
Total Responses	75	
Position Experience		
0–1 years	4	4.82%
2–4 years	10	12.05%
5–7 years	15	18.07%
8+ years	51	61.45%
Total Respondents	80	
District Information		
Unit District	53	76.81%
High School District	16	23.19%
Small	14	20.29%
Medium	31	44.93%
Large	24	34.78%
EBF Tier 1	30	43.48%
EBF Tier 2	20	28.99%
EBF Tier 3	4	5.80%
EBF Tier 4	15	21.74%
Total Respondents	69	

Note: Not all respondents shared their position experience. District information came from the 2022–23 Illinois Report Card, 14 respondents did not provide the name of their school.

related to the various survey items. Overall results are presented first followed, where possible based on response rates, with CPS specific results.

The goal of the surveys was to provide a descriptive understanding of the current state of high school transitional math implementation in Illinois. As such, the analysis was descriptive in nature, providing primarily frequency data related to the various survey items. Overall results are presented first followed, where possible based on response rates, with CPS specific results.

Community College Representative Interviews Related to Transitional Math Implementation

To recruit community college participants, we reached out to 43 principal contacts at community colleges with approved transitional math programs as of spring 2022, and we were able to conduct 13 one-on-one semi-structured interviews via Zoom. Table 2 presents each interviewee's position, affiliated campus setting, and campus size. Each virtual interview was around 45 minutes following the interview protocol (see Appendix 2), which covers general questions about the implementation of transitional math, how it impacts their students and their colleges, what the implementation process was like for them, what challenges they have encountered, and what additional support they need moving forward.

Interview transcriptions and formalized and typed observation field notes (Miles et al., 2019) were coded manually using an inductive analysis (Saldaña, 2015). After emerging codes were identified for the interviews, respective codebooks were created. All data was then coded deductively utilizing the codebooks and revisions were made accordingly. Once the codebook was finalized, the cycle was repeated, and all interviews were coded using the finalized codebook. A matrix was created and used to help organize the data (Miles et al., 2019). The matrix also facilitated the systematic analysis by creating visual connections across transcripts that resulted in the themes.

Table 2. Community college interview participants.

POSITION	CAMPUS SETTING	SIZE
Faculty	City	5,001–10,000
Department Chair/Dean	City	5,001–10,000
Faculty	City	10,001–20,000
Department Chair/Dean	Town	1,001–5,000
Department Chair/Dean	Suburb	10,001–20,000
Faculty	Suburb	Above 20,000
Faculty	City	1,001–5,000
Faculty	Rural	10,001–20,000
Faculty	Suburb	10,001–20,000
Department Chair/Dean	Rural	1,001–5,000
Staff	Rural	1,001–5,000
Department Chair/Dean	Suburb	10,001–20,000
Staff	Rural	10,001–20,000

Interviews Related to Transitional Math Data Utilization

For the case study into transitional math data utilization, we focused on a single region in Illinois that had well established relationships amongst secondary and postsecondary systems as well as a history of implementing transitional math. This allowed for the potential of data utilization to have been established and in place. We used a consistent semi-structured interview protocol (Appendix 3) at both the secondary and postsecondary levels which was focused on what data was collected and how data was stored, analyzed, and used to support the design and implementation of transitional math. We interviewed key district level personnel in two unit school districts who worked directly on the implementation and support of transitional math in their district. We also interviewed key personnel of institutional research at the community college the districts fed into. Institutional research personnel were asked about how the community college utilizes institutional research data to support transitional math programs and student success.

Section 2. Findings

School District Survey Responses Related to Transitional Math Implementation

Finding 1. While Quantitative Literacy and Statistics was the most commonly offered transitional math pathway, other offerings existed.

Respondents were asked to indicate which transitional math pathways were offered in their building. The vast majority of schools responding indicated they had at least one pathway (90.36%) with nearly 16% of schools reporting having multiple pathways (see Table 3). While Quantitative Literacy and Statistics (QLS) represented the most common pathway offered, STEM and Technical Math pathways were in place in 21 and 14 schools, respectively. The pattern for transitional math course offerings within CPS closely mirrored statewide patterns as nearly all schools from CPS that offered a transitional math course offered the QLS pathway.

Table 3. Transitional Math pathways offered.

	STATEWIDE			CPS		
	RESPONDENTS	%	# OF SCHOOLS	RESPONDENTS	%	# OF SCHOOLS
At least one pathway	83	90.36%	75	10	80%	8
QLS Pathway	83	69.88%	53	10	70%	7
STEM Pathway	83	25.30%	21	10	40%	4
Technical Pathway	83	16.87%	14	10	10%	1
Multiple pathways	83	15.66%	13	10	30%	3

Note: Data from survey responses.

Finding 2. Eligibility criteria used go beyond PWR Act eligibility guidance.

Respondents were asked to select the criteria their school used to determine eligibility for each of the transitional math pathways offered in their building. While the PWR Act includes guidance for enrollment eligibility by pathway (PWR Act Transitional Math Competencies and Policies, 2021), the criteria selected by respondents included aspects beyond the minimums laid out in the policy (see Table 4). Despite completion of high school math graduation requirements being a requirement for participation in a transitional math pathway, not all respondents reported using this as a criterion in determining eligibility. Of note, this does not mean schools are enrolling students in transitional math courses that have not completed their high school graduation requirements—it may mean some respondents interpreted the question as asking how they determined which pathway to recommend an individual student enroll in. Follow-up interview or survey work could help clarify if schools were, in fact, not using prior completion of math graduation requirements as a necessary condition for transitional math eligibility. Teacher recommendations were highlighted as a consistent factor in determining eligibility as were previous course grades with both being most common in Quantitative Literacy and Statistics compared with the STEM and Technical Math pathways. Table 5 presents the patterns for CPS respondents related to the QLS pathway as there were only 2 responses for the STEM pathway and 0 for the Technical Math pathway. The CPS specific patterns generally mirror the statewide pattern for QLS. Table 5 presents the patterns for CPS respondents related to the QLS pathway as there were only 2 responses for the STEM pathway and 0 for the Technical Math pathway. The CPS specific patterns generally mirror the statewide pattern for QLS.

Respondents were given the opportunity to share written responses about the eligibility process via open response questions. The eligibility process was discussed differently by different transitional math pathways. For instance, respondents discussed encouraging students who “do not feel math is their strongest subject” but plan on continuing education beyond high school. According to one respondent, “this class [QLS] replaced what used

Table 4. Criteria used to determine student eligibility, by pathway.

	QUANTITATIVE LITERACY AND STATISTICS PATHWAY			STEM PATHWAY			TECHNICAL MATH PATHWAY		
	RESPONDENTS	%	# OF SCHOOLS	RESPONDENTS	%	# OF SCHOOLS	RESPONDENTS	%	# OF SCHOOLS
GPA	50	12.0%	6	16	18.8%	3	10	0.0%	0
PSAT/SAT or ACT scores	50	30.0%	15	16	18.8%	3	10	20.0%	2
Teacher recommendations	50	82.0%	41	16	50.0%	8	10	80.0%	8
Previous math course grades	50	76.0%	38	16	68.8%	11	10	70.0%	7
Completion of high school graduation requirements	50	54.0%	27	16	56.3%	9	10	60.0%	6
Other	50	26.0%	13	16	43.8%	7	10	20.0%	2

to be ‘College Algebra.’” Respondents often talked about the Technical Math pathway eligibility in relationships to the trades and about students not planning to pursue a four-year degree. One respondent stated that they identify students for Technical Math “if the student is also enrolled in some type of trade elective class.” Another noted that students who are “in a career program concurrently at our school (Welding, Machining, Auto, Robotics [sic] etc)” are those they consider eligible for Technical Math. The STEM pathway was linked several times with more stringent standards, linked to fourth year math for college applications. Eligibility was discussed as being determined based on “their postsecondary plans and selecting the course that best aligns with their future career option.”

Table 5. Criteria used to determine student eligibility by pathway, in CPS.

	QUANTITATIVE LITERACY AND STATISTICS PATHWAY		
	RESPONDENTS	%	# OF SCHOOLS
GPA	5	0.0%	0
PSAT/SAT or ACT scores	5	20.0%	1
Teacher recommendations	5	80.0%	4
Previous math course grades	5	100.0%	5
Completion of high school graduation requirements	5	60.0%	3
Other	5	0.0%	0

Finding 3. Opportunities exist to better inform students about transitional math connections to postsecondary education.

Table 6 shows the types of information provided to students by schools to help students understand different transitional math pathways. While nearly all respondents shared course descriptions with students, less than 50% of respondents shared information about how transitional math pathways connected to postsecondary institution coursework. This represents an opportunity to support students and inform their decision-making about transitional math generally as well as about specific transitional math pathways. The results for CPS once again are very similar to the statewide story with all schools sharing course descriptions with students, less than half of schools providing information about how pathways connect with community college coursework.

Table 6. Information buildings offer to students to help them understand transitional math pathways available.

	ALL			CPS		
	RESPONDENTS	%	# OF SCHOOLS	RESPONDENTS	%	# OF SCHOOLS
Informational booklets and documents	63	12.70%	8	7	14.29%	1
Course descriptions	63	88.89%	56	7	100.00%	7
Information about how pathways connect with local community college coursework	63	41.27%	26	7	42.86%	3
Other	63	15.87%	10	7	0.00%	0

Table 7 presents the types of information respondents used to help guide student enrollment decisions. Only 2 responses out of 68 indicated student college or career aspirations were considered, and these two were only when assisting students in deciding about transitional math participation. Input from parents or guardians was considered in about 36% of the responses for the QLS pathway and about 57% in the STEM pathway. CPS respondents differed slightly from the statewide QLS patterns in the universal use of previous math grades, a higher use of information related to the completion of high school requirements, and more parental/guardian input (Table 8).

Respondents were invited to share how they provided supports to students via open-response questions. Three practices emerged from their responses: 1) respondents reported having one-on-one conversations with students about their enrollment in a transitional math pathway; 2) respondents held group conversations or presentations to inform both students and parents/guardians about transitional math pathways; and 3) students were provided with direct “invitations” to enroll in particular classes. Further investigation into how students were supported in their decision-making is warranted to ensure students and their families understand how transitional math pathways connect to college and career.

Finding 4. Supports offered to transitional math pathway students were similar to what all students received.

When provided with the opportunity to share what supports were offered to transitional math pathway students, respondents routinely responded that the supports were similar to what all students regardless of courses would receive. This included study hall options, opportunity for “tutoring during and after school,” “extra help from the teacher if needed and asked for,” and “just typical supports.” While it appears that transitional math students do receive supports to be successful, there does not appear to be any unique supports offered to transitional math students.

Table 7. Information considered when helping students make enrollment decisions, by pathway.

	QUANTITATIVE LITERACY AND STATISTICS PATHWAY			STEM PATHWAY			TECHNICAL MATH PATHWAY		
	RESPONDENTS	%	# OF SCHOOLS	RESPONDENTS	%	# OF SCHOOLS	RESPONDENTS	%	# OF SCHOOLS
GPA	44	25.00%	11	14	28.57%	4	10	20.00%	2
Teacher recommendation	44	22.73%	10	14	14.29%	2	10	30.00%	3
PSAT/SAT or ACT Scores	44	77.27%	34	14	35.71%	5	10	70.00%	7
Previous math grades	44	88.64%	39	14	85.71%	12	10	100.00%	10
Completion of high school graduation requirements	44	59.09%	26	14	0.00%	0	10	70.00%	7
Student's college and career aspirations	44	0.00%	0	14	14.29%	2	10	0.00%	0
Parental/Guardian input	44	36.36%	16	14	57.14%	8	10	0.00%	0
Other	44	4.55%	2	14	7.14%	1	10	0.00%	0

Table 8. Criteria used to determine student eligibility by pathway, in CPS.

	QUANTITATIVE LITERACY AND STATISTICS PATHWAY		
	RESPONDENTS	%	# OF SCHOOLS
GPA	5	20.00%	1
Teacher recommendation	5	20.00%	1
PSAT/SAT or ACT Scores	5	80.00%	4
Previous math grades	5	100.00%	5
Completion of high school graduation requirements	5	80.00%	4
Student's college and career aspirations	5	0.00%	0
Parental/Guardian input	5	60.00%	3
Other	5	0.00%	0

Finding 5. While transitional math pathway completers received information upon completion, more information about accessing credit-bearing postsecondary courses is needed.

Respondents were asked whether they provided transitional math completers with different types of information. Table 9 displays their responses. Nearly all programs provided completers with information about the local community colleges. Most respondents shared information about four-year colleges and universities and opportunities to defray the costs of attending a postsecondary institution. While the majority shared information about how to engage in credit-bearing coursework, there were still 25 respondents who did not provide this information to students. CPS appears to more consistently share information about local four year institutions, about how to engage in credit-bearing coursework, and about financial aid, scholarships and grants. This variation in what was provided to completers was reflected in the related open-responses. Some schools have what they described as “a comprehensive program that provides this information electronically, in large group settings, classroom settings, and individually.” Others respond that they provide “the same support we give to any other student,” despite the unique characteristics of transitional math pathways. Others do not provide information systematically because “our closest community college isn’t the one most of our students attend; we do not have many conversations about this topic.”

Table 9. Information buildings provide to students completing a transitional math pathway, statewide and CPS.

	STATEWIDE			CPS		
	RESPONDENTS	%	# OF SCHOOLS	RESPONDENTS	%	# OF SCHOOLS
Information about local community colleges	58	91.38%	53	7	85.71%	6
Information about local four-year postsecondary institutions	58	74.14%	43	7	85.71%	6
Where and how to access credit-bearing coursework	58	56.90%	33	7	71.43%	5
Information about financial aid, scholarships, and grants	58	79.31%	46	7	85.71%	6
Other	58	10.34%	6	7	0.00%	0

Community College Perspectives on Transitional Math Implementation

Finding 1. Transitional math programs have mixed impacts on student success and college enrollment.

When it comes to students’ math learning and college success, community college partners largely agree that transitional math is beneficial for the targeted student population. As math is not required in the senior year, participants agreed that transitional math allows its targeted students, who would have otherwise not taken a fourth-year math course, to continue a math course. A dean at a large suburban community college described how transitional math can increase students’ chances of college enrollment with expanded college opportunities in a “more comfortable environment or less threatening environment than a college math course.” One dean at a small rural community college also mentioned,

Honestly, I feel like transitional math has been the most effective for those students that are coming directly from high school to us because it puts them in that fourth year of math and keeps them at least kind of cultured into thinking mathematically.

However, within individual colleges, there is a general lack of data access and evaluation to support the transitional math program's positive impact on student success, such as students' college attendance and college-level course success. A few colleges collected data using surveys sent to high school counselors and teachers in order to assess the effectiveness of the program, but they expect additional resources and collaboration with the Office of Institutional Research to examine the effectiveness of transitional math.

Community colleges have expressed interest in learning about how transitional math influences college enrollment. Overall, the participants did not notice prominent enrollment increases due to transitional math alone. Several participants indicated that even though the total enrollment may stay the same, the enrollment distribution between developmental courses and college-level courses may have changed. One math faculty in a medium rural community college discussed the reduced number of developmental math sections in general due to a couple of possible reasons. "We've decreased our need for developmental math... When I first started there, we have like 22 sections... I don't even want to say a number because it'll probably be wrong, but it's so dramatically decreased." An administrator in K-12 collaboration from a medium-sized rural community college noted that:

Our goal is to try and make sure that as we get those students coming in and they're going to be better prepared to be successful, right away in that college-level math class and not get spun around in a developmental ed cycle and spend money and time and get frustrated and then quit.

The participants acknowledged the difficulty in isolating the impact of transitional math from the larger developmental education reform taking place in Illinois. The dean of a small community college shared:

As we've shifted to multiple measures, we have definitely had a smaller number of students that are still in remediation. So there's been a lot of changes not only at the state level but within our own program. Over the last five years, almost every year, we've made so many changes that it's hard to really know where we're at. I don't have a good gauge of it, because we've made each year a new change and you don't know where the students are in the process specifically. And they go at different paces.

One faculty in the liaison position of a medium urban community college also provided a few examples:

As the state changed placement criteria... for example, a 3.0 [high school] GPA or higher is college-ready. The campus placement exam went away, and we had to figure out a new math placement exam. So we went with the ALEKS placement exam. This was also around that time [when transitional math was implemented]. We were working on co-requisite courses. And then there's also this HB 2170... basically said, community colleges should have mechanisms in place to make sure they're increasing that they have a maximized probability of students getting into a college-level math course their first year.

Given how COVID-19 has directly affected student learning across the secondary and postsecondary sectors, COVID-19 can potentially lead to a lower participation rate in transitional math programs, students' college readiness, and even the relationship-building and effective communication between high schools and community colleges. An administrator in K-12 collaboration from a medium-sized rural community college attributes the lack of successful evidence of transitional math to the 18-month timeline for transitional math to be eligible for college-level placement:

The students have 18 months until the expiration of their placement. So a student may have graduated this academic year. But we may not know for another year and a half whether or not that student is going to enroll into that college math class... [It] plays a role in not knowing for sure.

While community colleges value portability is desirable by community colleges, there are times when high school transcripts are not automatically shared with community colleges. The responsibility fell on individual students and students may not take advantage of the placement function of transitional math. The administrator who oversees P-20 collaboration at a rural small community college noted:

We tell all of our high school faculty that students need to advocate for themselves. Because [when] they come in and register, our advisors say, "Oh, it looks like you're in a transitional math class that will put you in [a college-

level math course]. But you need to submit a final transcript. So we're trying to work through a system for that. We're saying, "Remind your high school students that when this is done, they need to submit a final transcript."

Colleges do not use transitional math programs as a recruitment tool or have limited recruitment efforts for transitional math students. One math faculty at a small urban community college responded by saying:

That would be our recruitment and marketing department... Outside of the math department, our dean, and probably the advisors, I don't think anyone else in college is really aware of transitional math.

The administrator who oversees P-20 collaboration at a rural small community college noted:

We talked about recruiting all the time. But there's just who's responsible for it often changes in a small school. We're not visiting schools; we're not pressuring them to say, "come to us!" Certainly, our college supports them the best we can, but we don't have the bandwidth to do that either.

A dean of a medium community college in the suburban area, however, noticed the positive outcomes of collaborating with high schools on student recruitment.

[Transitional math] wasn't meant to be a recruiting tool. That was not what we were trying to do. But it kind of turned into it from the standpoint of, "Hey, you should be paying attention to what's going on at your local community college.

Most community colleges are driven by their desire to support students and communities rather than their self-interests even when many community colleges experience a severe enrollment drop during the pandemic since 2020.

Finding 2: The partnership between high schools and community colleges is key to transitional math program implementation.

Across the board, community college participants describe transitional math implementation as a process of trust-building and resource-sharing with broad participation to ensure course rigor. Community colleges value the relationship-building process with local high schools. One math faculty at a small urban community college described the K-12 collaboration as "a real eye opener...for our faculty to look at what was happening with transitional math and that process and what they wanted." Many participants provided detailed information to depict a picture of the successful implementation of transitional math, such as the local advisory panel with good representations from both sectors, the establishment of a liaison position at community colleges to lead communication with high schools, a consistent application process across school districts, professional development with incentives, and online resources dedicated to transitional math implementation.

For example, community colleges believe that transitional math design should prioritize course rigor and authentic learning for students. High schools and community colleges developed MOUs to outline the responsibilities of each party (e.g., curriculum design, professional development, exam development) to ensure transitional math course rigor. One math faculty in the liaison position mentioned that "We met with all the teachers, principals, and superintendents, and we're getting constant feedback from them. I think the local advisory panel is critical for transitional math to work." The department chair of a small urban community college provided specific examples:

[Students] are taking the exact same content and courses that we ourselves teach. And we oversee it on our side, we have an agreement with [the high schools]... We do edit together [on examination]. I create the master file based on college-level expectations, and I edit it according to the needs and understanding of students from the [high school] faculty side...So we feel strongly that the [transitional math] students that come in are properly prepared.

A few participants also highlighted the importance of high school teachers' expertise and qualifications in teaching transitional math that teachers with both experiences of teaching high school students and a clear understanding of college-level math expectations contribute to student learning. However, it is worth noting that

some colleges benefited from the previous collaboration with K-12 through dual credit coursework or locally articulated transitional math course prior to the PWR Act; while other colleges with no such prior collaboration in place exerted more efforts to initiate the collaboration as a response to transitional math programs.

In the meantime, community colleges also have experienced considerable navigation of different cultures and policies and competing interests between high schools and colleges. In the process of relationship-building with high schools to support student success, community colleges experienced conflicts over different administrative policies and some unforeseeable challenges. For example, the department chair of a small urban community college discussed the “50% minimum rule” (which allows students to get no lower than a 50% on an assignment if they attempted to meet the basic requirements) and the “deeply articulated IEPs that sometimes make it difficult for us to feel like the standards aren’t the same.” Many participants highlighted how high school teachers and counselors serve as the main force encouraging students to participate in and succeed in transitional math. However, the cultural and resource differences between the secondary and postsecondary sectors require community colleges to adequately support K-12 partners and teachers in particular. One faculty from a small urban community college noted:

I think a lot of high school teachers are very guarded because they think the college teachers are going to yell at them and scream at them that the students are not prepared ... I know that they are under a lot of pressure there about what needs to be done to get the students graduated. I understand that... their hands are tied a lot, which is a shame... We understand what they’re going through. And it’s about working together... That’s hard sometimes.

A few participants also mentioned internal conflicts that some college faculty are “really on the perimeter,” while some other community college faculty have expressed concerns over job security due to potentially reduced course sections of developmental math due to transitional math programs, especially for colleges with a larger share of developmental education enrollment from local high school students. One math faculty and liaison person at a medium suburban community college said,

I do know that, without naming names, some faculty members aren’t as open and sharing all their [math course content]. Some felt threatened by this move: “They’re taking our jobs away.” ... So when I would go to department meetings and tell them what we’re doing, they’re like, “Our high school teachers give extra credit for bringing in cans of soup. ... We’re gonna lose our jobs, and they’re giving extra credit. My colleagues were nervous about those kinds of things.

One dean at a small rural community college attributed the reduced number of course sections to curricular changes including the offering of transitional math, the lower number in the remedial classes, consolidation of sections, and enrollment decline due to COVID-19. She continued, “Initially when we began [transitional math program]... Yes, they were worried about enrollments. But what they were more worried about is: How do we know that [students] were really actually prepared?... So I think that was the larger pushback.” From the department chairs’ or deans’ perspective, though personnel management can be a challenge as course sections are reduced, how to ensure course quality seems to be a more critical question to ask moving forward.

Finding 3: The choice among transitional math pathways is largely based on the alignment with career pathways and course offerings by community colleges.

When it comes to the decision on which transitional math pathway(s) to offer, each college and high school partnership seems to have its own logic and practical considerations in selecting the three pathway(s) of STEM, Quantitative Literacy/Statistics, and Technical Math. For example, some high schools choose the Quantitative Literacy/Statistics pathway because it is the pathway for the largest percentage of students that are non-STEM-oriented to keep math skills fresh and transition to college. Schools choosing the STEM pathway also justified their decision by noting that STEM math is applicable to all college-level math pathways (i.e., college algebra, general education math, technical math) as a higher-level placement indicator, providing students with flexibility as they transition to college learning. The staff member overseeing K-12 collaboration at a rural small community college noted that “When they [students] don’t know what they’re going to be when they grow up, they [high school counselors] don’t want to put them [students] in a lower level than is necessary. They’d rather shoot for STEM.” Other participants also describe the STEM pathway course as being the least duplicated with

co-requisite programs' Quantitative Literacy and Technical math components. One dean from a small community college mentioned that "The Technical Math course is almost identical to a lot of the college-level technical math courses."

Some high schools choose the Technical Math pathway because it aligns with their career pathways in manufacturing. The staff member overseeing K-12 collaboration at a rural small community college explained that "[The high schools] have students who cannot prove that they are college ready for math, [the technical pathway] will do it for them." Similarly, if the college in the partnership offers no relevant pathways in career and technical education, they typically do not choose to offer transitional math classes in the Technical Math pathway. A math faculty at a medium suburban community college indicated that they had not offered the Technical Math pathway, because "we don't offer that at the high school or at the college. So we had no place for them to go." Despite these general principles of selecting transitional math pathway(s), many participants agreed that advising students into different pathways can be challenging. High schools are often limited by existing resources to offer all pathways and meet each individual student's needs in math learning.

Finding 4: Despite equity concerns, little targeted support is provided for historically underserved transitional math students in particular.

Given the larger context of educational inequity, it is not surprising that the community college participants largely agree with potential equity concerns. Because educational inequity exists for all incoming college students, including transitional math students, transitional math completers receive generic instruction and student services (e.g., TRIO) once they enroll in college. One math faculty in a large suburban community college described the transitional math process as, "...Just get through the course. Let's see how you do and matriculate here and then the services that we offer here we offer to everybody; not just a transition math student or for one particular background." However, one department chair raised a comment about the differences between transitional math completers and developmental math completers, and it suggests transitional math completers' potential needs during their college transition.

We have people who have the intellect, but don't necessarily know how to be [college] students and therefore cannot be successful... A lot of these developmental courses aren't designed to just teach [students] the math they need to do. They're designed to prepare them for an extremely rigorous college environment. Are they getting that rigor at a high school for a [transitional] course?

Several participants mentioned that equal access and success in college readiness and success require support from more than one math class. One good example was provided by the department chair of a small urban community college that English proficiency prevents English Learner Students from being successful in transitional math courses because reading requirements are not specified in transitional math courses.

Similarly, inequity among school districts can further limit the resources available for their teachers and students. Some school districts are underserved because of their small size. An administrator in K-12 collaboration from a medium-sized rural community college mentioned that "Smaller school districts have few math teachers and they cannot just attend the professional development [instead of being in class]." Several other participants wondered if the virtual courses and more funding may be beneficial. The staff member overseeing K-12 collaboration at a small rural community college said, "I think the equity piece for small schools is going to be this virtual coursework. Again, is that the best way? No, but it still will meet the needs of some of our students." Many community college participants plan to ensure students have equal access to transitional math courses and benefit from this program in their future work.

Finding 5: The need for additional guidance from the state agencies in successfully designing, implementing, and evaluating transitional math.

One consistent response from the community college participants is about their need for additional guidance from the state agencies to continue the successful design, implementation, and evaluation of the transitional math program. The transitional math program relies on community colleges to initiate broad participation with an implementation system. Many participants commented on the benefits of receiving grant funding from ICCB, which directly enabled recipient colleges to conduct student surveys, build data systems, and support K-12 partnerships in general; however, not every participant is aware of the grant and how it was used to support the

transitional math program and its students. Community colleges have also increased leadership and resources in high school-college collaboration and attempted to make data-driven decisions. However, data access and interpretation seem to be a major challenge to guiding practices at community colleges. One dean from a small community college commented on the level of different information they receive from high schools:

All the data might be different, housed differently, or interpreted differently... One high school [provides] the grades, the names, and the genders of the students; but at another high school, the grades, the names, and the races of the students; and another high school something different. So it's like, you put all that information together, and we made some charts... So it wasn't very helpful... I would love to get a little bit more guidance ... where it's like, there's a standardized format for how the information will be turned into the college. And that standardized format is easy enough in high schools to actually fill out that they'll do it.

Coupled with local curriculum control in Illinois, the transitional math program focuses more on program goals than the means to achieve these goals, according to the participants. Many community colleges perceived the lack of or delayed state support, with respect to human resources, funding, and implementation process, as a major challenge in navigating the transitional math program at the local level. For example, participants have expressed polarized views about the length of transitional math courses because it is currently up to local decisions. Some colleges were in support of one-semester transitional math courses as opposed to one-year courses, because they prefer not to "be adding a barrier to the students that are now able to take that college class while they're still in a high school setting with the potential to be more successful." Some other colleges indicated concerns over the rigor of one-semester-long transitional math courses. For transitional math completers, taking dual-credit courses in the second semester of their senior year was described as "taking some students who aren't ready and then pushing them at double the speed."

Given the diverse needs of participants and partners, the lack of guidance directly leads to pushback from high schools and some college faculty members. Many colleges have experienced a lack of high school buy-in or motivation to participate in transitional math for a variety of reasons, such as a fear of lack of flexibility or frequent policy changes. One participant in a dean's role explained,

I have a school district that they're just adamant that this [transitional math] program is not for their students, because their students are too good for this. And there's nothing I can do about it. I mean, we've tried to be as nice as we can, and say there's a subset of your population—I'm sure the majority of them don't need it—But there's a subset that probably can really benefit from this. They don't even want to be associated with it, because it seems like it's beneath them.

Many community college participants expressed frustration over high schools offering transitional math courses "on the books" but with no actual students. One department chair from a medium college in a suburban area said:

A lot of them are still holding off on "Is this here to stay? Or is this just another one of those? If we wait long enough, we can wait. We can wait out the state and things will change again."

Many participants shared that the local high schools and colleges can benefit from additional communication with their peer institutions to learn more about the success and process of transitional math programs.

Case Study

Data Utilization Related to Transitional Math Within One Region

In order to better understand the current state of how data is utilized to learn from, support, and improve transitional math, we engaged in a case study of one region in Illinois. We talked with administrators in two school districts which offer transitional math courses and the local community college within that region. The following present the themes from these interviews, starting with how data is utilized within the secondary educational context before turning to the postsecondary context.

Through interviews with district level personnel in two different school districts, the following themes emerged related to the collection of data, the analysis of data, and the use of data within the secondary setting.

1. While districts have implemented transitional math and are actively enrolling students in transitional math classes, data utilization lags behind. One administrator stated that they “don’t use much data” while another administrator shared that while it would “be helpful to know students that are graduating, having taken transitional math, what their remediation rates are as freshmen in college” they are “not collecting anything close to that.”
 - a. Where data is used, it appears to be primarily anecdotal evidence with one administrator discussing how “it ends up being more of a gut check with the counselors and the counselor and ... student conversation of what are your plans.”
 - b. While both districts reported minimal additional data being collected beyond what was already collected for all students and courses, the one exception was one district administrator collecting data on whether their transitional math completers use their course placement waiver at the local community college: “I actually have a shared spreadsheet with [community college] where we have all of our transitional courses listed out with rosters on them.... And then what I will do in the fall, is I will go through our rosters and see what students actually came to [the community college] and used their placement waiver.” This is one administrator collecting the data on their own rather than a systematized process within the data systems of the district.
 - c. Even in the district where data was collected on placement waiver usage, there was no evidence of routines related to the analysis, reporting, or use of transitional math related data.
2. Secondary administrators defined transitional math success primarily as completion of course and use of use placement waiver. While two out of the three interviewees mentioned wanting to know how students performed in the college math course, these longer-term outcomes were brought up as a secondary thought or in response to other probes.
3. The supports laying the groundwork for transitional math in Illinois were impactful but there is a need for ongoing support related to implementation, data collection, and data analysis.
 - a. Initial infrastructure, definitions, and frameworks for implementation were seen as a strength. One administrator shared ““I think probably the state or those who are involved in this work can be really proud about the infrastructure that has generally been set up.... So conceptually, I think we’ve made good progress in ... developing the frameworks around what these courses are and what the curriculum is, and then how do we ... develop these partnerships or MOUs is all great, great progress.”
 - b. However, districts did not feel equipped to engage in data collection, analysis, or reporting related to transitional math.
4. School district administrators had multiple recommendations related to better using data to support students and improve transitional math.
 - a. With the limited capacity of staff and smaller enrollments in transitional math courses, administrators responded that having statewide or best practice information would help improve transitional math implementation in their contexts. This included looking at the best

practices for how students are placed into transitional math courses, how supports are offered to transitional math students, and ultimately understanding if the transitional math courses are meeting the needs of the enrolled students. As one administrator responded: "So that's a lot of what our conversations, hey, which kids should be taking this? How do we find what can we do to better identify more kids that should be taking this?" One administrator discussed how their small transitional math enrollment hampered their ability to understand if transitional math was working, "our data is gonna be like, so small ... because I've only got like 15 kids."

- b. All three administrators wanted systematic evidence about whether students used the placement waivers and the ongoing trajectory of transitional math course completers, for their students and for all Illinois students. This would include evidence about the students they serve but also statewide evidence about the impacts.

Based on qualitative interviews with the community college representatives in the focal region, we found the following themes related to data utilization:

1. The institutional research staff have limited involvement in data utilization of transitional math-related progress and impact because the non-credit-bearing transitional math course is delivered "in high school, not by the college."
2. No formal study or evaluation has been conducted by the college due to the lack of data access and personnel capacity. Specifically, K-12 data sharing was largely unavailable until recent efforts led by EdSystems. The staff member noted, "That work is leading to new information that didn't exist in the past." There also seems to be a lack of personnel capacity to clean and analyze the merged data. The staff member indicated that student-level data within the region can be complex: "People move within the district to different schools... I can imagine it's really messy."
3. It is the Institutional Research Office's intention and goal to help stakeholders (e.g., students, practitioners, educators) understand, for example, what transitional math is, its impact, and its implications for practices and future research.
 - a. The data utilization work aligns with the current scope of institutional research. In particular, the Institutional Research Office primarily collects, provides, and verifies data for academic units (e.g., responding to requests from individual departments), college-wide readiness measures (e.g., placement tests), and other student services areas (e.g., tutoring services). The data provided are both at the course-section level (e.g., success rate) and student level (e.g., demographics, transfer/graduation status).
 - b. The Institutional Research Office's data-related work serves to meet department needs and provide evidence for program reviews (e.g., ICCB's focus on quality, costs, and equity). The role institutional research staff play typically stops at data sharing without participating in the decision-making of academic or co-/extra-curricular programs.
4. The Institutional Research Office's staff members face challenges in potentially identifying the impact of transitional math programs on student success due to a couple of reasons:
 - a. The challenge of isolating the effect of COVID-19 and multiple student success initiatives implemented around the same time.
 - b. The lack of data due to the community college's open-access mission: "Students would provide transcripts if they wanted to."
 - c. The misalignment between what institutional research can do (e.g., correlational analysis with small sample size) and what is often expected from stakeholders (e.g., causal analysis with absolute answers).

References

Miles, M. B., Huberman, A. M., & Saldaña, J. (2019). *Qualitative data analysis: A methods sourcebook* (4th ed.). SAGE Publications.

Saldaña, J. (2015). *The coding manual for qualitative researchers* (3rd ed.). SAGE Publications.

Appendix 1. Survey Protocol for High School Counselors

Please check each of the transitional math pathways your building offers.

- Quantitative Literacy and Statistics
- Science, Technology, Engineering, and Math (STEM)
- Technical Math

What is your current title?

How many years have you been in your current position?

- 0-1
- 2-4
- 5-7
- 8+

The set of questions in this section are related to how you determine student eligibility for the transitional math pathways available in your building.

For the [Name of Pathway] pathway, what criteria do you use to determine student eligibility? Select all that apply:

- GPA
- PSAT/SAT or ACT scores
- Teacher recommendations
- Previous math course grades
- Completion of high school graduation requirements
- Other:

Briefly describe the process for how you determine if a student is eligible to enroll in the [Name of Pathway] pathway.

This set of questions focuses on the supports your building offers to students to guide them in enrolling in a transitional math pathway and in successfully completing that pathway.

What information do you provide to students to help them understand the transitional math pathways available to them? Select all that apply:

- Informational booklets, documents, etc.
- Course descriptions
- Information about how each pathway connects with the local community college coursework
- Other:

For the [Name of Pathway] pathway, what information do you consider when helping students make enrollment decisions? Select all that apply:

- GPA
- Teacher recommendation
- PSAT/SAT or ACT scores
- Previous math course grades
- Completion of high school graduation requirements
- Student's college and career aspirations
- Parental/Guardian input
- Other:

Please briefly describe the activities, supports, or processes you use to guide students in their decision about whether to enroll in a transitional math pathway. This can include informational sessions, one-on-one conversations, or other local practices.

What, if any, supports does your building offer to students enrolled in transitional math pathways to help them succeed in the coursework?

The following questions are aimed at learning about the supports and approaches your building takes to support students who have completed a transitional math pathway as they transition into college.

- Which of the following information does your building offer to students completing transitional math coursework? Select all that apply:
 - Information about local community colleges
 - Information about local four-year postsecondary institutions
 - Information about where and how students can access credit-bearing coursework after successfully completing their transitional math course
 - Information about financial aid, scholarships, and grants
 - Other:

Please briefly describe any activities, supports, or processes you use to support students as they continue on to postsecondary institutions, particularly related to ensuring they are able to access credit-bearing courses.

Please share any additional information related to transitional math in your building you think we should know in the space below.

One of the outcomes we hope for in this project is to provide answers to questions you have but have not yet been able to answer. If you have any questions you would like the research team to try and address, please share them below.

Appendix 2. Semi-Structured Interview Protocol—Transitional Math Implementation in Community Colleges

General Question

1. A few school districts in the service area of [community college name] started to offer transitional math courses since [the year of first offering]. Overall, how does transitional math influence [community college name]?

Influence on Student Readiness and Success

2. Based on your observation, how academically ready are transitional math students at the college level?
 - a. (If multiple pathways) Are the three pathways of students different?
 - b. How about students from more marginalized backgrounds, in terms of race/ethnicity, remediation needs, and socioeconomic status?
3. At [community college name], what are programs and initiatives that support transitional math students? Are there particular programs and initiatives targeted at different student populations, in terms of race/ethnicity, remediation needs, and socioeconomic status?
4. What do you think is important for faculty to know about teaching transitional math students?

Implementation of Transitional Math

5. How does transitional math influence your collaboration with other constituencies of [community college name], such as school districts, state agencies, etc.?
6. How does transitional math influence the recruitment/outreach strategies at [community college name]?
7. How would you describe the advising practices to serve transitional math students?

Recommendations

8. What recommendations do you have to improve transitional math and to improve transitional math student success and equity in particular?
9. What advice would you give to another person in administering transitional math programs or supporting transitional math students?
10. What would you like to learn more about transitional math in Illinois?

Participant Questions

11. Are there questions you wished I had asked you today about transitional math?
12. Do you have any questions for me?

Appendix 3. Semi-Structured Interview Protocol—Transitional Math Data Utilization

Introduction

The purpose of this interview is to understand what current data utilization practices are in place to support transitional math programs in the Rockford region. This interview is part of a larger evaluation project of statewide transitional math programs in Illinois. The following are questions to learn more about how your college/school district is utilizing data to support transitional math programs and student success.

Background Questions

1. What is your current role at (D100, RPS, RVC)?
2. Please share a brief overview of your department/program.
3. How long have you been working in support of the transitional math program at (D100, RPS, RVC)?
4. What role do you play in supporting the transitional math program at (D100, RPS, RVC)?

Data Utilization to Support Transitional Math

5. What data are collected to support transitional math programs and student success?
6. How are the data stored?
7. How are the data analyzed to support transitional math programs and student success?
8. How are the findings reported and shared to support transitional math programs and student success?
9. How are the findings used to guide practices in transitional math programs and student success?
10. Is there any particular focus on different student populations (e.g., women and girls, students of color, bilingual students)?
11. How do you define student success for Transitional Math?

Recommendations

12. What recommendations do you have to improve data utilization to better support transitional math programs?
13. Who else at your institution should we meet with?

Thank you for your time and insights!

