Lessons From Two Major Evaluations of Guided Pathways

By Davis Jenkins, Hana Lahr, and Thomas Brock

Community colleges in the United States do a remarkable job of making postsecondary education accessible to students from all backgrounds. Where they do less well is making sure that all degree-seeking students earn a credential or transfer to a four-year institution within a reasonable amount of time. A recent report from the National Student Clearinghouse Research Center shows that nearly 60% of degree-seeking community college students do not earn a certificate or degree at *any* postsecondary institution within six years of beginning at a community college. It also shows troubling disparities by race and ethnicity, with Asian and White students who enter community colleges earning credentials at notably higher rates than Black, Hispanic, and Native American students (Lee & Shapiro, 2023).

Numerous programs and initiatives have been launched in recent years to improve student outcomes at community colleges, but perhaps none are as well known or widespread as guided pathways. Guided pathways is a framework for whole-college reform designed to help all students explore, choose, plan, and complete programs aligned with their career and education goals efficiently and affordably. It emerged from years of research by CCRC and others and was introduced to the field in the 2015 book *Redesigning America's Community Colleges: A Clearer Path to Student Success* (Bailey et al., 2015). Since then, guided pathways has been supported by national organizations such as the American Association of Community Colleges (AACC) and has been used as a model for reform by over 400 community colleges and 18 state systems.

This brief summarizes the results of two recent evaluations conducted by CCRC to examine the scale at which colleges have implemented guided pathways reforms and the association between guided pathways practices and student outcomes. The first is an evaluation of the AACC Pathways Project, which involved 30 colleges from around the country that were committed to making guided pathways reforms. The second is an evaluation of guided pathways implementation in three states—Ohio, Tennessee, and Washington State—that launched initiatives to assist colleges across their systems—70 institutions in total—to adopt the reforms. In brief, we find that:

- Whole-college reform is feasible but takes time—at least five years—to accomplish.

- There is a positive relationship between the scaled implementation of complementary sets of guided pathways practices and some measures of student achievement in AACC Pathways colleges that made the most progress in implementing guided pathways

Guided pathways is a framework for whole-college reform designed to help all students explore, choose, plan, and complete programs aligned with their education and career goals. It has been used as a model for reform by more than 400 community colleges.

reforms and in one state (Tennessee) that got an early start on reforms and made good progress. In places that made less progress, the association is weak or not evident.

- While students from all backgrounds may benefit from guided pathways reforms, they are not sufficient to close gaps in achievement between racial and ethnic groups.

Below, we provide more details on the evaluations, including the study designs, principal findings, and implications for practice.

1 What is guided pathways? What makes it different from other community college reforms?

Guided pathways is a whole-college reform model designed to help community college students explore, choose, plan, and complete—in a reasonable time and cost—programs that enable them to secure a good job directly or successfully transfer to a bachelor's program in a specific major. It is based on more than two decades of research by CCRC and others on how to improve student success in community colleges.

The education model evident in most community colleges today is the "cafeteria college" model, which offers a wide range of programs designed to appeal to varied student interests. It evolved in the 1960s and 1970s in response to our nation's effort to dramatically increase access to higher education.

Redesigning America's Community Colleges argued that colleges organized on the cafeteria model are not well suited to helping students complete programs in a timely way or to preparing students for family-supporting jobs in today's economy. This is because the programmatic paths to career and baccalaureate transfer opportunities in those colleges are often unclear, and students are overwhelmed by too many choices. Support for entering students to explore career and college interests and develop an educational plan is typically limited, so many students lack direction and the motivation that comes with having a clear plan. Because students' progress is generally not monitored, they often self-advise and meander, taking courses that do not apply to a degree aligned with their interests and goals. In addition, too many entering students are diverted by standardized placement tests into prerequisite remedial (or "developmental") courses related to their field of interest.

Guided pathways provides a framework for the wholesale restructuring of academic programs and student supports to address the barriers to success created by the cafeteria college model. Administrators, faculty, and staff at adopting colleges work together to rethink current practice in four areas with the following objectives:

1. **Clarify paths to student end goals** by organizing programs into broad fields (or meta-majors) to facilitate student exploration and by "backward mapping" program pathways to ensure that they prepare students to secure a good job that offers living wages or to transfer with no excess credits to a four-year college in a particular major.
2. **Help students get on a path** by redesigning the onboarding experience to enable all students to explore interests and options, connect with an academic and career community, and develop a full program plan.
3. **Help students stay on path** by reorganizing advising to enable case management by field and by using students' plans to schedule classes and monitor progress.

4. **Ensure students are learning valuable skills** by placing them into college-level courses (rather than developmental courses) as quickly as possible and ensuring that they have opportunities for active and experiential learning in their programs of study.

The guided pathways model is based on research indicating that discrete interventions targeted to particular student groups or phases of the college experience are not sufficient to substantially increase student success rates. Instead, colleges need to redesign and align programs, practices, and systems at scale using research-based principles. Guided pathways does not eliminate the need for specific interventions designed for students who may benefit from targeted supports. Rather, guided pathways provides an overarching framework for serving all students while helping to identify students who may need more help and aligning efforts to provide it.

2 How did we evaluate guided pathways? What were the strengths and limitations of our approach?

CCRC conducted two major evaluations to shed light on the feasibility of implementing guided pathways reforms at scale and on the association between implementation and improvements in student outcomes. The strength of these studies is that they include a large number of colleges (approximately 100) across the U.S. and capture the early college experience of successive cohorts of first-time-in-college students at these colleges over an extended time period—7 to 10 years (capturing student outcomes before and after guided pathways adoption). Their chief limitation is that they are not causal, meaning that we cannot say definitively whether any improvements we observe are the result of guided pathways.[1] The two evaluations nevertheless provide useful insights into practices that show promise for improving student outcomes for large numbers of students. Below, we describe the methods we used.

AACC Pathways Evaluation

The AACC Pathways Project was a national initiative launched in 2015 with funding from the Bill & Melinda Gates Foundation. Managed by AACC, the Pathways Project had the dual goals of supporting a group of community colleges as they sought to implement the guided pathways model and learning from their experience to help build knowledge and advance the field.[2]

Through a competitive application process, AACC selected 30 colleges from 17 states—representing a wide variety of institutions by size, geography, governance, and program and student mix—whose leadership embraced the challenge of redesigning the experience for their students at scale following the guided pathway model. Cross-functional teams of administrators, faculty, and staff from these colleges participated in a series of six three-day institutes during which they learned about the guided pathways model from national experts and fellow higher education practitioners, analyzed institutional data, and worked through questions and activities aimed at helping them examine the current student experience at their institutions and design reforms in practice following the guided pathways framework. CCRC led the knowledge development component of the project and used the 30 colleges as sites for research on various aspects of the reforms being implemented.

The evaluation focused on the adoption of guided pathways practices and trends in student outcomes at these colleges. To measure adoption, we administered an institutional self-assessment on a model set of practices, similar to what is shown in Table 1.[3] The assessment asked colleges, for example, whether they grouped similar programs of study into "meta-majors" to make it easier for students to get on an academic path that would lead to a credential of value (practice 1a) and whether they introduced all students to meta-majors through mandatory orientation or first-year experience courses (practice 2a). It asked similar questions about other guided pathways practices. CCRC advised colleges on how to complete the assessment and conducted verification calls to ensure the information they provided was accurate. Colleges completed the assessment on an annual basis to measure their implementation progress, and they received formative feedback from CCRC.

Table 1.
Guided Pathways Model Practices

PRACTICE	MEASURE
Practice Area 1. Mapping paths to student end goals	
1a. Meta-majors	Programs organized by meta-major AND students' meta-major tracked
1b. Career and technical education (CTE) program maps	CTE programs mapped to related jobs/careers
1c. Transfer program maps	Transfer programs mapped to related majors
1d. Math pathways	Program-specific math sequences mapped
Practice Area 2. Helping students get on a program path	
2a. Meta-major exposure	Either mandatory orientation or mandatory first-year experience course AND either meta-major content or field-focused events
2b. Required career assessment and advising	All students given career assessments and undergo initial advising
2c. Early program-related coursetaking	Students advised to take program foundation course in term 1
2d. Mandatory educational planning	Students helped to develop an educational plan in term 1 AND can see plan online
Practice Area 3. Keeping students on a path to completion	
3a. Mandatory ongoing advising	Mandatory advising for returning students
3b. Caseload advising by field	Caseload advising AND advisors assigned by meta-major
3c. Progress monitoring and feedback	Students helped to develop an educational plan in term 1 AND checkpoint advising or registration alerts
3d. Scheduling for on-time completion	Classes scheduled based on students' plans
Practice Area 4. Ensuring that students are learning across programs	
4a. Corequisite college math	Students placed in corequisite math AND corequisite support aligned with math subject
4b. Program foundation course improvement	Instructional improvement in program foundation courses other than math by meta-major

To measure trends in student outcomes, CCRC focused on the early momentum metrics (EMMs) shown in Table 2. EMMs measure the progress of students in the first year of college (for students who have no previous college experience or credits, including from dual enrollment courses taken in high school). Research by CCRC and others finds that EMMs are correlated with longer term community college completion and transfer success for students generally (Belfield et al., 2019), with especially strong benefits for students

of color and low-income students (Lin et al., 2023). Thus, year-over-year improvements in such metrics can serve as leading indicators that more students will likely succeed in the longer term.

Table 2.

Early Momentum Metrics Used in the AACC Pathways Project

CREDIT MOMENTUM	COLLEGE COURSE COMPLETION	GATEWAY MATH AND ENGLISH COMPLETION	PERSISTENCE
• Earned 6+ college credits in term 1 • Earned 12+ college credits in term 1 • Earned 15+ college credits in year 1 • Earned 24+ college credits in year 1 • Earned 30+ college credits in year 1 • Attempted 15+ credits (developmental or college level) in term 1 • Attempted 30+ credits (developmental or college level) in year 1	• College-level course completion rate in students' first academic year • Average college credits attempted in year 1 • Average college credits completed in year 1	• Completed college math in year 1 • Completed college English in year 1 • Completed both college math and college English in year 1	• Persisted from term 1 to term 2

Given the guided pathways theory of change—which holds that colleges need to implement a set of complementary, aligned practices across the student experience to improve outcomes—we hypothesized that colleges that adopted a larger set of model practices at scale would see greater increases in EMMs than colleges that adopted a smaller number of practices. We used 2016 (the year the Pathways Project began) as the baseline year and tracked each college's EMMs for cohorts of entering students from 2012-13 through 2020-21. Using data from the institutional assessment, we examined EMMs for three groups of colleges: (1) "fully scaled"—those that had implemented the guided pathways model practices for all or nearly all entering students or programs by 2022; (2) "scaling in process"—those that were still in the process of scaling the model; and (3) "prerequisite math barrier not yet addressed" for colleges that had made some progress but were less far along in adopting corequisite math instruction or other strategies to help students complete college-level math within their first year. We then plotted trend lines to compare changes over time in student performance at colleges in these three groups.

NSF Evaluation

Our second evaluation was launched in the fall of 2019 with funding from the National Science Foundation (NSF). Its goal was to examine in greater depth and more rigorously than had been done before the implementation and scale of adoption of guided pathways reforms and the relationship of these reforms to student academic outcomes in general and in STEM programs in particular. To do this, we partnered with state agencies or associations in three states—Tennessee, Ohio, and Washington—that together encompass 70 public two-year colleges. These three states had all launched statewide initiatives (in 2015, 2016, and 2018, respectively) aimed at supporting community colleges to adopt guided pathways practices. All three states conducted a series of institutes where teams from colleges could learn about guided pathways practices and plan reforms. The states also provided coaching and other supports for colleges to implement reforms at scale.

For the NSF evaluation, CCRC used a one-time institutional self-assessment to capture the adoption of guided pathways practices at colleges in each state, focusing on the model practices shown in Table 1. For each practice, colleges were asked to identify the term and year it was first implemented at scale, meaning that it affected at least 80% of programs or

at least 80% of first-time-in-college students. CCRC administered the assessment to 69 colleges in spring 2022 and received completed questionnaires from 63 colleges, for an overall response rate of 91%.

To assess student cohort outcome trends over time, we examined first-year transcript-level information on over 800,000 students who entered college through one of 62 public two-year colleges[4] in Ohio, Tennessee, and Washington in the fall terms between 2010 and 2020. We focused on four primary indicators of early academic momentum:

- College-level credits earned in the first year;
- College-level math credits earned in the first year;
- College-level science, technology, engineering, and math (STEM) credits earned in the first year;
- Fall-to-fall persistence.

We used multiple regression techniques to understand the association between guided pathways reforms and early student outcomes in the three states. To help ensure that the analysis was unbiased, the CCRC researchers who conducted this analysis were experts in quantitative analysis who had not previously been involved in guided pathways research, and the methods and results were reviewed by experts in quantitative evaluation of education reforms.

3 What did we learn about the feasibility of implementing guided pathways reforms at scale?

Both evaluations identified some colleges that implemented most of the guided pathways model practices shown on Table 1 *at scale*—that is, for at least 80% programs or for at least 80% of entering students. More commonly, colleges were still in the process of implementing reforms when our data collection ended in early 2022.

Among the 30 colleges involved in the AACC Pathways Project, which started in 2016, 11 had implemented most of the model at scale by fall 2021.[5] Another 12 were in the process of scaling these practices—with most on track to do so by fall 2022. Six others had taken steps to map programs and redesign the program onboarding experience but had not scaled corequisite support in math.[6]

In the three states in the NSF study, a smaller proportion of colleges implemented a substantial number of the model practices at scale.[7] Table 3 shows the number of colleges in each state that implemented 9–14 (high adopters), 5–8 (medium adopters), or 4 or fewer (low adopters) guided pathways model practices at scale.

Table 3.

Level of Guided Pathways Adoption Among Colleges in NSF Study States in 2022

	HIGH ADOPTERS (9 or more practices implemented at scale)	MEDIUM ADOPTERS (5–8 practices implemented at scale)	LOW ADOPTERS (4 or fewer practices implemented at scale)
Ohio	7	9	3
Tennessee	6	7	0
Washington	5	13	12
Total number of colleges	19	29	15

Across the states, colleges tended to implement and scale guided pathways practices from practice areas 1 and 2 first (clarifying paths and helping students get on a path), as these are generally required before implementation in practice areas 3 and 4 (helping students stay on a path and ensuring they are learning valuable skills).[8] The adoption of corequisite math (4a) bucked this trend, as it can be implemented on a more independent timeline.[9] In all three states, regardless of level of model adoption, colleges were most likely to have scaled practices in practice area 1, including mapping pathways in career-technical education (1b) and transfer programs (1c) and identifying key math pathways within those maps (1d). Most colleges also encouraged early program gateway coursetaking (2c). In general, low-adopter colleges were less likely than others to have scaled program advising (2b and 3a), planning (2d), and progress monitoring practices (3c). The practice least likely to have been implemented at scale among all colleges was scheduling for on-time completion (3d), a critical structure and form of support for promoting student progress.
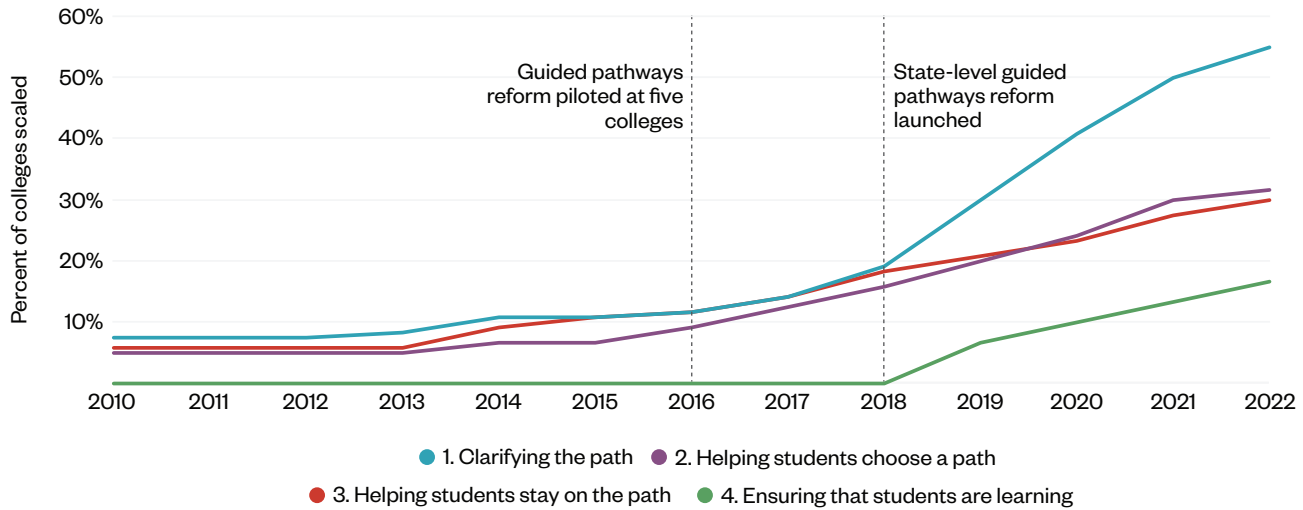
Broadly, both studies show that while some colleges were successful in adopting the guided pathways model practices, implementing them at scale takes a long time—so most were still in the process of scaling by the end of each study period in 2022. The remaining colleges made little progress in scaling guided pathways practices or made some progress but still had in place prerequisite remediation in math. Many colleges in both studies were on track to implement guided pathways at scale by fall 2020 or 2021 but put their efforts on hold when COVID-19 hit. Yet, nearly all of them have resumed these efforts, indicating in interviews that doing so is even more important now to attract and retain students in the post-COVID environment.

CCRC's research on guided pathways since *Redesigning* points to reasons why it takes so long to implement guided pathways reforms at scale. To begin with, making fundamental changes to the educational model most community colleges have followed for decades is a heavy lift. It requires strong, sustained leadership, active involvement from stakeholders across the college, and skilled implementation over several years—in most cases at least five (Jenkins et al., 2019). Instituting whole-college reforms has been particularly challenging in a period of uncertain resources, declining enrollments, increased competition, and generational leadership turnover. It is also worth noting that many colleges in both studies spent a great deal of time early on engaging faculty in mapping programs, redesigning websites, and pursuing other efforts to improve the quality of program information. While fundamentally important, early efforts such as these do not themselves substantially change the experience for most students and are therefore unlikely to improve student outcomes.

The NSF research also provides evidence that state policy can influence the trajectory with which colleges adopt guided pathways practices. Corequisite math, for example, was widely adopted by community colleges in Tennessee in 2015 and 2016 when it was strongly recommended by the Tennessee Board of Regents. In Washington, the State Board for Community and Technical Colleges (WSBCTC), with funding from College Spark Washington, developed a grant program to pilot guided pathways reforms at 10 colleges in two cohort stages, one from 2016 and another from 2018. These colleges received grants to support their work, which is ongoing. Following the rollout of the pilot, the Washington legislature approved funding for guided pathways at all the state's technical and community colleges in 2019 (WSBCTC, 2024). The influence of these policy actions is evident in Figure 1, which shows when colleges in Washington implemented practices in the four practice areas at scale.

Figure 1.

At-Scale Adoption of Practice Areas 1–4 Over Time Among Washington Colleges

1. Clarifying the path   ● 2. Helping students choose a path
3. Helping students stay on the path   ● 4. Ensuring that students are learning

4 Is there evidence that guided pathways improves student outcomes? Do some groups of students benefit more or less than other groups of students?
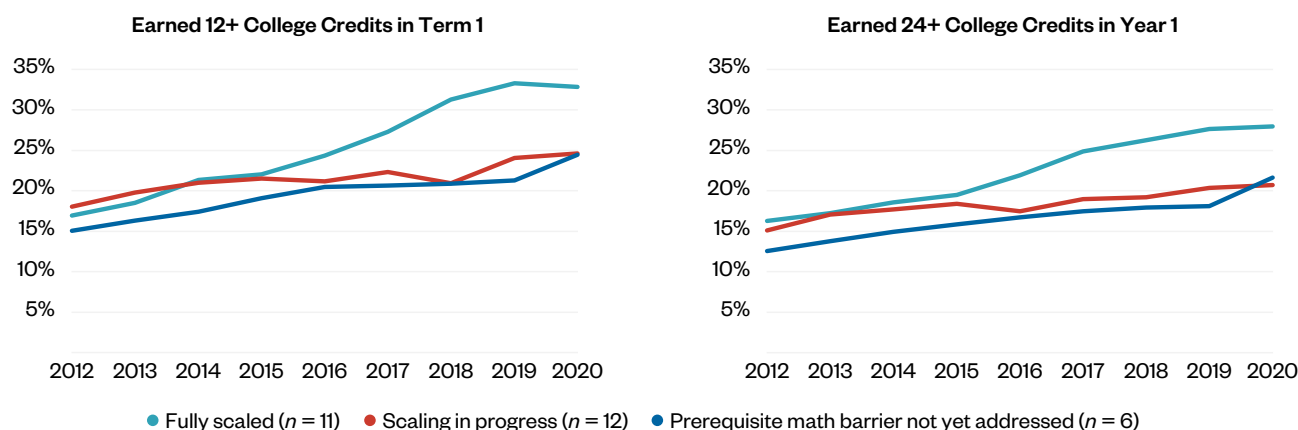
Both studies found evidence of an association between the adoption of guided pathways practices and improvements in leading indicators of student success in the longer term, although the findings from the NSF study, which relied on more rigorous quantitative analysis, were more mixed.

Findings From the AACC Pathways Evaluation

Using descriptive data on trends in EMMs, we found that most of the 30 colleges saw improvements on most EMMs over the five years after the initiative started compared to the several years before.[10] Notably, however, colleges that adopted a fully scaled set of model practices saw markedly higher increases in EMMs. For example, as shown in Figure 2, for both the "12+ college credits in term 1" and "24+ credits in year 1" EMMs, the trend lines for the 11 fully scaled colleges diverge from those for the other two groups of colleges starting in 2016 and continue to increase at a higher rate. This is what we would hypothesize for colleges further along in redesigning practices, such as program planning and progress monitoring, that affect the student experience.

Figure 2.
Trends in Meeting College Credit Thresholds by AACC Pathways College Group

Earned 12+ College Credits in Term 1 — Earned 24+ College Credits in Year 1

● Fully scaled (*n* = 11)   ● Scaling in progress (*n* = 12)   ● Prerequisite math barrier not yet addressed (*n* = 6)

We also saw larger increases in the rates at which first-year students successfully completed college math and English courses after the AACC Pathways Project began for colleges that adopted a fully scaled set of practices than for those that did not. These EMMs are important because college-level math and English are required for virtually all degree programs. Moreover, research has shown that failing math impedes momentum for many college students, particularly those from underserved groups (Scott-Clayton & Rodriguez, 2015).

The AACC Pathways study did not see positive differences for fully scaled colleges for two EMMs: the college-level course completion rate and the rate of persistence from term 1 to term 2. The former is less problematic because a null finding suggests that the fully scaled colleges did not make it easier for students to pass courses. The persistence finding is more concerning because research shows the importance of continuous enrollment without stopping out (Crosta, 2014). This result may in part be due to the COVID-19 pandemic, which led to steep declines in community college enrollments starting in the 2019-20 academic year.

When we disaggregate EMM trends for the three groups of AACC Pathways colleges by student race/ethnicity, we find that average EMM rates for all racial/ethnic groups in the fully scaled group increased more rapidly than in the other groups after 2016, which is consistent with the overall trends. However, similar gaps between racial/ethnic groups remained for the fully scaled colleges. In other words, even though we observe a greater rate of improvement in EMMs across all student groups among colleges that fully scaled the guided pathways model, those colleges did not close equity gaps. This pattern is evident in Figure 3, which compares trends by student race/ethnicity between the fully scaled colleges and scaling-in-progress colleges for the "earned 12+ college credits in term 1" EMM.

Figure 3.

Trends in "Earned 12+ College Credits in Term 1 by Race/Ethnicity": Two AACC Pathways College Groups Compared

Fully Scaled Colleges   **Scaling-in-Progress Colleges**

Asian ● Black ● Hispanic ● White ● Other
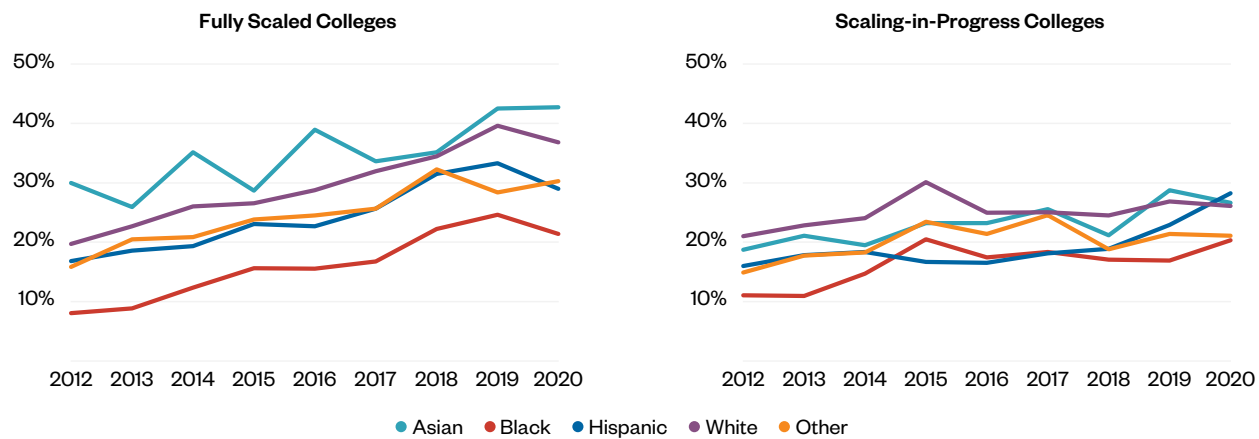
Findings From the NSF Evaluation

For the NSF project, we conducted three sets of multivariate analyses using the institutional assessment responses and student administrative data from each college to examine whether there was an association between adopting guided pathways practices and early student momentum.[11] While the findings are more mixed, the study does provide insight into the effects of component practices of the model.

The first analysis examined whether launching statewide guided pathways reforms led to improvements in early momentum. We did not find consistently positive trends among colleges in Ohio and Washington, but we observed notable improvements in Tennessee, specifically in college-level credits earned in the first year and in fall-to-fall persistence. The methodology does not allow us to know whether the changes observed are due solely to guided pathways reforms or to other reforms adopted at the same time. In 2015-16, for example, Tennessee's 13 community colleges scaled other reforms such as corequisite remediation in reading, writing, as well as math, and the state launched the Tennessee Promise free college program, making it impossible to disentangle the effects of guided pathways. The improvements in student momentum observed were likely the result of multiple reforms.

In a second set of analyses, we used responses from the institutional assessment on when colleges adopted particular practices to examine trends in student momentum before and after colleges scaled at least five practices. We found that increasing adoption intensity to at least five practices is not strongly associated with improvements in early student outcomes, though drawing conclusions for Washington may be premature given that we could examine only two years of data following the launch of its statewide initiative in 2018.

In a third set of analyses, we used regression analysis and data mining techniques to isolate the effects on early student momentum of specific guided pathways model practices and combinations of practices. Interestingly, we found that, on their own, some specific practices may benefit early student outcomes while others may hinder them. For example, corequisite college math is positively associated with college-level credits earned in the first year in Tennessee and Washington, while math pathways is associated with substantial increases in college-level math credits earned in the first year across all three states. By

contrast, mapping career-technical programs and mandatory educational planning are, by themselves, negatively correlated with persistence (though the point estimates are small).

When examining the effects of guided pathways practices in combination with one another, we found that adopting practices across practice areas is associated with larger improvements in early academic success than adoption of any individual practices. In Tennessee, adopting practices in practice areas 1 (clarifying paths to student end goals) and 3 (keeping students on a path to completion) results in a nearly twofold increase in college-level credits earned, compared to the adoption of any single practice or to the moderate- or high-intensity adoption of practices. The combination of adopting practices in areas 1, 2 (helping students get on a program path), and 3 is associated with improvements in math and STEM credits earned in Tennessee and Washington and with student persistence in Washington. Ohio colleges achieved more significant gains in the number of college-level credits earned by adopting multiple practices within practice area 3 as opposed to adopting practices together across different areas.[12]

5 Moving forward, what should colleges do differently based on what we have learned?

The AACC Pathways evaluation found that, compared to colleges that were still scaling guided pathways reforms, colleges that adopted a more fully integrated set of model practices at scale (including developmental education reform) saw markedly higher rates of improvement in college credit accumulation and passing college math in the first year (though not in student persistence). In contrast, the NSF study found no evidence that adopting at least five guided pathways practices is associated with improvements in early momentum across colleges in Ohio, Tennessee, and Washington. However, the NSF study did find that the complementary adoption of practices within and across guided pathways practice areas is correlated with larger improvements in early academic success than the adoption of any individual practice.

Thus, the findings of both studies are broadly consistent with the central premise of guided pathways: Improving student success requires colleges to implement at scale a set of complementary practices that change the experience for all students, not just particular groups, in entering and making progress in a program. The two studies also point to specific areas for further reform if community colleges are to change students' experiences in ways that substantially improve outcomes for all students while closing equity gaps. We describe below a number of recommendations for community colleges undertaking guided pathways reforms.

Offer ongoing advising, predictable schedules, and other supports to help students complete their plans.

Both studies found that average persistence rates did not increase, suggesting that while helping students onboard and gain credit momentum in a program is important, students also need help staying in college and completing on time. In fact, the NSF study revealed that combinations of practices that included those in practice area 3 (helping students stay on path) had the strongest associations with early student success. Mapping out programs, organizing them more coherently, and improving information about them for students—as

many colleges in the NSF study did—is not sufficient to change student experiences and outcomes. Similarly, helping incoming students explore career and college interests and develop an educational plan is not likely to help them progress in their programs unless they also receive ongoing advising (ideally by advisors knowledgeable about their field of study) and unless students (and advisors) use the plans to monitor their progress and schedule their classes. Improving scheduling for on-time completion—a critical guided pathways practice that was the least likely to be adopted by colleges in both studies— is much needed by community college students, who generally are juggling myriad responsibilities and have little time and resources for school.

Remove the obstacle to student success created by prerequisite remediation, particularly in math.

The two evaluations also provide evidence about the importance of corequisite remediation and math pathways. These practices are intended to ensure that students take college-level math courses aligned to their programs of interest. AACC Pathways colleges that made substantial reforms to student onboarding and advising but kept in place prerequisite mathematics did not see any marked improvements in early student momentum. With respect to the NSF study, Tennessee's community colleges—for which improved early student outcomes are observed—began using corequisite math remediation and math pathways in 2015 and 2016. By contrast, corequisite math was much less common in Ohio and especially Washington. This could be one reason why the NSF study did not find evidence of improved trends after guided pathways reforms were launched in those two states.

Take steps to strengthen teaching and learning in program gateway courses outside of math and English composition.

Other research indicates that corequisite and other reforms to developmental education, though necessary, are not sufficient for improving student success beyond math and English composition course completion (Ran & Lin, 2022). The fact that neither the AACC Pathways study nor the NSF study found evidence of improved college-level course success rates is consistent with a finding from our prior implementation research that even colleges further along in scaling guided pathways reforms have generally not done much to systematically strengthen pedagogy in courses outside of math and English. Strengthening active and experiential learning in program foundation courses and throughout programs is a critically needed next frontier for the guided pathways reform movement (Wang, 2020).

Implement tailored guided pathways practices for students from underserved groups.

In the AACC Pathways study, we see improvements in key leading indicators for all racial/ethnic groups of students, but equity gaps nevertheless persist. This finding supports the idea that adopting guided pathways reforms is not sufficient to close equity gaps. In other CCRC research on guided pathways, we have seen the need to customize or personalize practices according to the needs and circumstances of particular student groups (Klempin & Lahr, 2021). Put differently, even with guided pathways, colleges must be proactive in tailoring support for first-generation and low-income students, students of color, older

returning students, and other groups with different needs. Indeed, early adopter AACC Pathways colleges that have seen improvements for students overall are now scrutinizing the reforms they have made through an equity lens to ensure that these practices do not unwittingly reinforce tracking by race/ethnicity, income, gender, and other factors.

Build on-ramps to career-path college degree programs for underserved K-12 students after high school.

The roots of equity gaps between student groups by race/ethnicity and family income are complex and include inequitable access to well-resourced primary and secondary education. This realization has spurred some colleges to extend guided pathways practices to underserved students in K-12 by, among other strategies, rethinking dual enrollment as an on-ramp to college programs of study for high school students (Fink & Jenkins, 2023). Practices focused on dual enrollment equity pathways (DEEP) help students explore and make progress in a program of study while they are still taking dual enrollment courses, thus giving them a jump start on a college credential.

All of these areas for further improvement among colleges embarking on guided pathways reforms are the focus of ongoing research by CCRC on improving community college student success and institutional performance. We have been encouraged to see in this continuing work that, despite the many challenges facing community colleges and their students, the momentum for redesigning community colleges to better serve students remains strong. This gives us optimism that community colleges that were early adopters of guided pathways will be able to build on the gains they have already achieved.

Endnotes

1. For a literature review and discussion of the challenges of evaluating a whole-college reform model like guided pathways, see Brown et al. (2022).
2. For more on the AACC Pathways Project, see AACC (n.d.).
3. For a review of the research behind the model practices, see Jenkins et al. (2023).
4. One college was excluded from the analysis because it adopted a new educational model involving online education for large numbers of students from outside the state.
5. For details on the findings of the AACC study, see Lahr et al. (2023).
6. Only one college, where leadership was unsuccessful in convincing faculty and others of the value of guided pathways, had not scaled practices in at least one of the four practice areas shown in Figure 1.
7. For details on the findings of the NSF adoption study, see Jenkins et al. (2023). For details on early student outcomes associated with adoption in the NSF study, see Minaya and Acevedo (2024).
8. Implementing ongoing advising models (3a), developing schedules based on students' program plans (3c), and investing in teaching and learning in core programmatic courses (4b) generally require meta-majors and support for students' early progress (practice areas 1 and 2).
9. In particular, corequisite math was widely adopted in Tennessee in 2015 and 2016, when it was strongly recommended by the Tennessee Board of Regents. Adoption of corequisite math also increased in Ohio in 2018, when the Ohio Association of

Community Colleges and the Ohio Department of Higher Education launched a statewide effort to scale corequisite reforms in math and English through Strong Start to Finish. In comparison, relatively few Washington community colleges had adopted corequisite math with math pathways by 2022.

10. For details on the findings of the AACC Pathways evaluation, see Lahr et al. (2023).
11. For details on the findings of the NSF evaluation, see Minaya and Acevedo (2024).
12. Yet a positive association is observed in Ohio with college-level math credits earned when practices in practice areas 1 and 3 are adopted together.

References

American Association of Community Colleges. (n.d.). *AACC Pathways Project.* https://www.aacc.nche.edu/programs/aacc-pathways-project/

Bailey, T. R., Jaggars, S. S., & Jenkins, D. (2015). *Redesigning America's community colleges: A clearer path to student success.* Harvard University Press. https://ccrc.tc.columbia.edu/publications/redesigning-americas-community-colleges.html

Belfield, C., Jenkins, D., & Fink, J. (2019). *Early momentum metrics: Leading indicators for community college improvement.* Columbia University, Teachers College, Community College Research Center. https://ccrc.tc.columbia.edu/publications/early-momentum-metrics-leading-indicators.html

Brown, A. E., Minaya, V., & Lahr, H. (2022). *A strategy for estimating the effects of whole-college guided pathways reforms in community colleges* (CCRC Working Paper No. 128). Columbia University, Teachers College, Community College Research Center. https://ccrc.tc.columbia.edu/publications/estimating-effects-whole-college-guided-pathways-reforms.html

Crosta, P. M. (2014). Intensity and attachment: How the chaotic enrollment patterns of community college students relate to educational outcomes. *Community College Review, 42*(2), 118–142. https://doi.org/10.1177/0091552113518233

Fink, J., & Jenkins, D. (2023). *Rethinking dual enrollment as an equitable on-ramp to a career-path college degree program after high school.* Columbia University, Teachers College, Community College Research Center. https://ccrc.tc.columbia.edu/publications/revamping-dual-enrollment-equitable-college-degree-paths.html

Jenkins, D., Lahr, H., Brown, A. E., & Mazzariello, A. (2019). *Redesigning your college through guided pathways: Lessons on managing whole-college reform from the AACC Pathways Project.* Columbia University, Teachers College, Community College Research Center. https://ccrc.tc.columbia.edu/publications/redesigning-your-college-guided-pathways.html

Jenkins, D., Myers, T., & Matin, F. (2023). *Whole-college guided pathways reform: Scale of adoption by community colleges in three states.* Columbia University, Teachers College, Community College Research Center. https://ccrc.tc.columbia.edu/publications/whole-college-guided-pathways-reform.html

Klempin, S. C., & Lahr, H. (2021). *How Ohio community colleges are using guided pathways to personalize student support.* Columbia University, Teachers College, Community College Research Center. https://ccrc.tc.columbia.edu/publications/ohio-guided-pathways-personalize-student-support.html

Lahr, H., Klempin, S., & Jenkins, D. (2023). *Innovating at scale: Guided pathways adoption and early student momentum among the AACC Pathways colleges.* Columbia University, Teachers College, Community College Research Center. https://ccrc.tc.columbia.edu/publications/guided-pathways-aacc-colleges.html

Lee, S., & Shapiro, D. (2023). *Completing college: National and state report with longitudinal data dashboard on six- and eight-year completion rates.* National Student Clearinghouse Research Center. https://nscresearchcenter.org/completing-college/

Lin, Y., Fay, M. P., & Fink, J. (2023). Stratified trajectories: Charting equity gaps in program pathways among community college students. *Research in Higher Education, 64,* 547–573. https://doi.org/10.1007/s11162-022-09714-7

Minaya, V., & Acevedo, N. (2024). *Whole-college reforms in community colleges: Guided pathways practices and early academic success in three states* (CCRC Working Paper No. 136). Columbia University, Teachers College, Community College Research Center. https://ccrc.tc.columbia.edu/publications/guided-pathways-practices-early-academic-success-three-states.html

Ran, F. X., & Lin, Y. (2022). The effects of corequisite remediation: Evidence from a statewide reform in Tennessee. *Educational Evaluation and Policy Analysis, 44*(3), 355–379. https://doi.org/10.3102/01623737211070836

Scott-Clayton, J., & Rodriguez, O. (2015). Development, discouragement, or diversion? New evidence on the effects of college remediation. *Education Finance and Policy, 10*(1), 4–45. https://doi.org/10.1162/EDFP_a_00150

Wang, X. (2020). *On my own: The challenge and promise of building equitable STEM transfer pathways.* Harvard Education Press.

Washington State Board for Community and Technical Colleges. (2024). *Washington guided pathways.* https://www.sbctc.edu/colleges-staff/programs-services/student-success-center/guided-pathways.aspx