

# PATHWAYS TO RESULTS

## IMPLEMENTATION PARTNERSHIPS STRATEGY BRIEF

SEPTEMBER  
2017

Office of Community College Research and Leadership

### Engaging CTE and Math Faculty in Curricular Change at Black Hawk College and Kishwaukee College

by Chaddrick Gallaway and Marci Rockey

Black Hawk College and Kishwaukee College, both veteran institutional participants in the Pathways to Results (PTR) process, embarked upon projects to address barriers to student completion within their math pathways. While the pathways and institutional contexts were different, both projects required the engagement and commitment of faculty. These collaborations enhanced institutional efforts to improve math pathways for students.

#### Identifying the Problem

Based on their analysis of program data, Black Hawk College identified completion of the technical math courses in their CNC certificate and engineering technology associate programs as a barrier to completion for non-traditional-aged students. Similarly, the data analyzed by the team at Kishwaukee showed there were barriers at the point of transition between developmental mathematics and technical mathematics courses for under-prepared students in their horticulture, electronics, manufacturing, and other career and technical (CTE) programs.

#### Implementing Improvement

Black Hawk College chose to implement a three-fold approach to improve mathematics pathways for non-traditional-aged students. First, based on data gathered from students and faculty in the program, Black Hawk College bolstered student support services through targeted outreach from the Special Populations Coordinator, the implementation of supplemental instruction and tutoring, and a textbook loan initiative. Second, as a result of engaging faculty and employers in the project, Black Hawk College implemented a dual credit course option. Finally, the college is engaged in an ongoing technical mathematics curriculum mapping project. Through this work, the team is examining how mathematics coursework is sequenced and how mathematics courses align with other technical courses throughout each program of study.

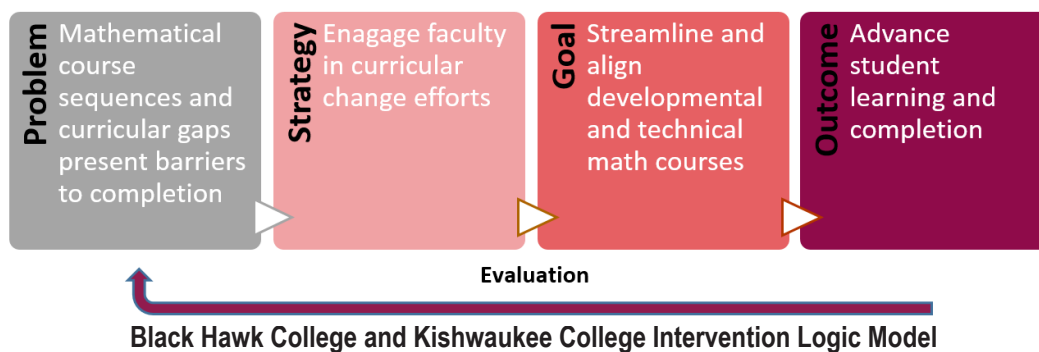
Kishwaukee College's project focused on intensive curriculum mapping of the technical mathematics pathway. Four workgroups were created that partnered one math faculty member with a representative from each occupational program. Overall, the workgroups audited approximately 40 different courses utilizing concept inventories to propose revisions to the curriculum. To support this work, Kishwaukee College brought a representative from the Charles A. Dana Center at the University of Texas at Austin (Dana Center) to campus to facilitate the process and provide professional development. Building on their curriculum mapping work, Kishwaukee College is conducting a review of placement score prerequisites and course sequencing for students transitioning between developmental mathematics and technical mathematics pathways embedded in their CTE programs of study. Kishwaukee College's PTR team capitalized on the impact of their project by connecting their work with a large institutional initiative focused on the redesign of their developmental math pathways.

#### Mapping the Logic Model

At Black Hawk College, the team chose to facilitate student focus groups to supplement the quantitative data driving the project. As a result, the team's focus encompassed both curricular and student support aspects. Through this data the project team learned there were important gaps in knowledge about their engineering technology associate programs for both potential students and local employers. They

#### About Pathways to Results: Implementation Partnerships

PTR is an outcomes-focused, equity-guided process to improve student transition to and through postsecondary education and into employment. The process engages community college practitioners and their partners to identify and understand the problematic aspects of systemic design--whether processes, practices, policies, or pedagogies--and to find sustainable solutions that will support equitable student outcomes. In 2016, a second project year was added to the Pathways to Results model, titled PTR: Implementation Partnerships. Teams who participated in an Implementation Partnership, or "Year Two," project work to implement, evaluate, and scale their work in a network of other colleges striving to improve equitable student outcomes in innovative ways.



also learned they needed to build students' awareness of the program requirements and the technical mathematics needed to successfully matriculate through the program and graduate. As a result, Black Hawk College's PTR project served as a vehicle to strengthen existing partnerships with the area career center and employers and as an impetus for creating new partnerships and enhancing overall awareness of the engineering technology programs.

Kishwaukee College cited the support of the Dana Center as critical to their ability to design changes to both their mathematics and CTE program curricula. Kishwaukee College engaged support from the Dana Center based on the Dana Center's expertise in co-requisite models for developmental math. The Dana Center Mathematics Pathways Model helps higher education institutions solve, change, and implement scalable policy changes quickly. The core principles of the model are:

- “ 1) all students, regardless of college readiness, enter directly into mathematics pathways aligned to their programs of study;
- 2) students complete their first college-level mathematics requirement in their first year of college;
- 3) strategies to support students as learners are integrated into courses and are aligned across the institution; and
- 4) instruction incorporates evidence-based curriculum and pedagogy. (Charles A. Dana Center, 2017) ”

## Engaging CTE Faculty and Mathematics Faculty in Collaborative Curricular Change Efforts

The effective collaboration between CTE faculty and mathematics faculty was seen as imperative to improving mathematics pathways and outcomes for students at Kishwaukee College. Engaging faculty members in design activities as professional development has been identified by researchers as one way to address “the tension in teaching language to support mathematics learning of highly contextualized material” (Gomez et al., 2015, p. 461). The importance of providing professional development opportunities for faculty and investing in faculty partnerships in relation to curriculum mapping was identified as integral to implementing and scaling change at Kishwaukee College. This, too, is supported by research that has shown that the professional development of math

instructors is one of the essential elements in improving student outcomes, because instructors gain a new system of skills and practices for teaching their students how to understand mathematics (Edwards, Sandoval, & McNamara, 2017). For Black Hawk College, engaging both a single full-time faculty member and numerous adjunct faculty in these efforts was essential in their efforts to explore curricular options within the mathematics pathway and how these courses integrate within their CTE programs of study. Kishwaukee opted to utilize a portion of their PTR funding for faculty stipends. Investing in this opportunity for faculty partnerships across disciplines has proven to be a wise investment resulting in the identification of necessary changes to both occupational and mathematics content courses that strengthen alignment and streamline content. Both teams found that by successfully engaging faculty they were able to enhance internal partnerships and facilitate wide-based involvement in their curricular mapping and improvement efforts.

## Acknowledgements

We would like to acknowledge Cathy Dorathy, Black Hawk College's team leader, and Chase Budziak, Kishwaukee College's team leader, whose thoughtful reflections recorded through blogs, interviews, and on-campus meetings contributed to this strategy brief.

## References

- Charles A. Dana Center (2017). Dana Center Mathematics Pathways [website]. Retrieved from <https://dcmathpathways.org/dcmp/dcmp-model>
- Edwards, A. R., Sandoval, C., & McNamara, H. (2015). Designing for improvement in professional development for community college developmental mathematics faculty. *Journal of Teacher Education, 66*(5), 466-481. doi: 10.1177/0022487115602313
- Gomez, K., Gomez, L. M., Rodela, K. C., Horton, E. S., Cunningham, J., & Ambrocio, R. (2015). Embedding language support in developmental mathematics lessons: Exploring the value of design as professional development for community college mathematics instructors. *Journal of Teacher Education, 66*(5), 450-465. doi: 10.1177/0022487115602127