Boxed in: Structural Limitations to Flexible Pacing in Michigan Competency-Based Education Pilot Districts

December 2022

Education Policy Innovation Collaborative

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ACKNOWLEDGEMENTS

We are grateful to the Michigan Department of Education and to the five CBE pilot districts for their assistance with and participation in this study. We thank Andrew Middlestead, Katherine Cermak, Phoebe Gohs, and Stephen Nemeckay from MDE and the district superintendents, school principals, teachers, and other educators who have been generous with their time and guidance. We would also like to thank Andrea Bingham for her thoughtful comments on the paper, and the Hewlett Foundation for their generous support of this research. Any errors are our own and all opinions expressed in this paper are those of the authors and do not necessarily reflect the views of Michigan State University, the Michigan Department of Education, or the study's funder.

DECEMBER 2022

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ABSTRACT

Over the last decade, policymakers have been experimenting with competency-based education, an instructional reform that relies on flexible pacing to enable students to achieve content mastery at their own pace. In this paper, we draw on mixed-methods data from teacher surveys and interviews to examine the use of flexible instructional pacing in five Michigan school districts implementing competency-based education. While implementing flexible pacing was challenging for all five districts, we identified several promising practices that facilitated flexible pacing in their districts. These included the adoption of school-wide interventions and the ability of teachers to share students across classrooms. These practices resulted from explicit prioritization of flexible pacing in some districts, whereas in others, they occurred somewhat by happenstance. In all cases, structural challenges (e.g., the division of time and space and the allocation of students to individual classrooms) inherent in "the grammar of schooling" impeded some or all efforts to implement flexible pacing. It will be essential to tackle these structural challenges to flexible pacing in future efforts to implement competency-based education reforms.

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INTRODUCTION

Competency-based education (CBE) is an instructional model centered on using flexible and individualized instructional pacing to allow students to learn and achieve topical mastery at their own pace. Over the last 10 years, educators and policymakers have expressed a growing interest in adopting CBE to foster deeper learning amongst students in K-12 settings (e.g., Colby, 2019; Harrington & Green, 2021; Pane et al., 2017; Walser, 2021). As evidence accumulates about the negative impacts of the COVID-19 pandemic on student learning (e.g., Goldhaber et al., 2022a, 2022b; Kilbride et al., 2021, 2022), competency-based models have become even more salient as a potential instructional strategy to "accelerate" student learning by meeting students where they are in their educational trajectories and allowing them to progress at their own pace towards demonstrating mastery (e.g., American Institutes for Research, 2021; Moumoutjis, 2021; Straehley, 2021). Traditionally, K-12 students have progressed through learning targets with their classmates; however, one of CBE's core components is flexible pacing, where teachers and students work together to determine the appropriate learning pace (Wright, 2020). By emphasizing flexibility, students have better opportunities to meaningfully engage with learning targets and only advance once they have demonstrated mastery, which may create a better foundation for meeting future learning targets. Despite CBE's appeal, its implementation and effective use require substantial changes to the instructional core and structure in use in most public K-12 schools. In the wake of the COVID-19 pandemic, there are over 200 bills related to personalized and competency-based learning (Brixey, 2022); however, before

districts begin translating these bills into practice, those interested parties need to understand the realities and challenges of implementing CBE.

While other implementation studies of CBE have focused on multiple components and broader challenges, this paper focuses on CBE's provision of flexible student pacing. We do so for two primary reasons. First, as noted above, there has been increased national attention to the need to "accelerate learning" as students return to in-person schooling in the aftermath of the COVID-19 pandemic, and many policymakers and others have proposed that educators should institute flexible pacing to accomplish this goal (e.g., Jenkins, 2020). Therefore, those who wish to implement flexible pacing—whether as a part of CBE or as a standalone reform—must understand factors that facilitate and complicate its use. Second, and relatedly, although flexible pacing is a unique and central component of CBE, previous research suggests it is infrequently observed in practice (e.g., Evans & DeMitchell, 2018; Evans et al., 2019). The current body of literature has offered different explanations for this lack of fidelity, including the difficulty of defining what learning mastery looks like (e.g., Steiner et al., 2017; Stump et al., 2017), normative beliefs about work habits and deadlines (e.g., Steele et al., 2014), and insufficient professional development programming for planning and enactment of new practices (e.g., Pane et al., 2017; Steiner et al., 2017). Other explanations suggest that traditional school and classroom structures and practices are substantial barriers to adopting flexible pacing (e.g., Evans & DeMitchell, 2018; Evans et al., 2019; Moumoutjis, 2021).

However, while research has shown that traditional school structures impede the implementation of more challenging CBE components, such as flexible pacing, research has not clearly identified why and how these structures limit implementation fidelity. Moreover, the literature also provides insufficient evidence differentiating how elementary and secondary school structures shape opportunities for flexible pacing. Finally, our research design and context uniquely contribute to the literature. We address these gaps through a mixed-methods study of CBE implementation in Michigan. A limited subset of studies has employed a mixed-methods design (Bill & Melinda Gates Foundation, 2014; Pane et al., 2015, 2017; Shakerman et al., 2018; Steele et al., 2014). Of those studies, only Steele et al. (2014) explicitly examined CBE, while others focused on personalized and proficiency-based learning. While many of these studies have explored implementation in Northeastern states (e.g., Massachusetts, Connecticut, Maine, New Hampshire, Rhode Island, New York), we provide some of the first evidence from school districts in a Midwestern state.

Drawing on surveys and teacher interviews, we examined promising practices that facilitated flexible pacing in a set of Michigan CBE pilot districts, as well as structures inherent in "the grammar of schooling" that hindered the use of flexible pacing. In this paper, we answered the following research questions:

1. What promising practices facilitating flexible pacing are CBE pilot districts implementing?;

2. In what ways do school structures (e.g., scheduling, pacing guides) affect teacher enactment of flexible student pacing?

In the following sections, we first review the relevant literature on CBE, highlighting challenges associated with providing students with flexible pacing. We then discuss Tyack and Tobin's concept of the grammar of schooling, which we use as a framing device for our analysis. We then discuss our survey and interview data and the mixed methods strategies we used to answer our research questions. From there, we present results and close with a discussion and implications for policy and practice.

RELEVANT LITERATURE

Defining CBE and Flexible Pacing

CBE's origins can be traced to the mastery learning movement, which suggested that learning should be organized around mastery rather than traditional measures of time (e.g., seat time) (Basham et al., 2016; Colby, 2019; Evans et al., 2020; Patrick & Kennedy, 2013; Torres et al., 2015). It is also commonly associated with personalized learning. Differentiating between personalized learning and CBE can be difficult. Two separate publications from the Aurora Institute, "Mean what you say: Defining and integrating personalized, blended, and competency-based education (Patrick et al., 2013) and "Competency-Based Education and Personalized Learning go hand in hand" (Sturgis, 2017), argue that these are complementary frameworks. According to Sturgis (2017), personalized learning relies on the competency-based structures that produce consistency in validating proficiency based on student work, and careful monitoring of pace and progress. This consistency and monitoring are important for districts and schools becoming accountable for student success. Personalization without a competency-based system has the potential to perpetuate and, in some instances, even exacerbate inequity. Competency-based education without personalization means that students will not receive the instruction and support they need to learn. While the design of competency-based structures and personalized learning practices naturally support equitable education, realizing this goal requires intentionality.

In a later publication from Aurora, scholars explained that "CBE offers the foundation for personalized learning to occur (Casey & Sturgis, 2018).

Proponents of CBE argue that what differentiates it from more traditional instructional approaches is the emphasis on mastery and advancement, where students are required to demonstrate mastery of competency statements before they advance to new competencies (e.g., Levin & Patrick, 2019) and the emphasis on flexible pacing

(e.g., Evans et al., 2020). Accordingly, researchers (Le & Wolfe, 2014; Levine & Patrick, 2019; Lewis et al., 2014; Sturgis et al., 2011) and organizations supporting CBE (e.g., Aurora Institute, Knowledge Works) have crafted a common definition of the reform, comprised of seven core elements:

1. Students are empowered to make decisions about their learning experiences, how they will create and apply knowledge, and how they will demonstrate their learning.
2. Assessment is a meaningful, positive, and empowering learning experience for students that yields timely, relevant, and actionable evidence.
3. Students receive timely, differentiated support based on individual learning needs.
4. Students progress based on evidence of mastery, not seat time.
5. Students learn actively using different pathways and varied pacing.
6. Strategies to ensure equity for all students are embedded in the culture, structure, and pedagogy of schools and education systems.
7. Rigorous, common expectations for learning (knowledge, skills, and dispositions) are explicit, transparent, measurable, and transferable.

Proponents of CBE highlight the importance of flexible pacing—the ability of students to advance once they have demonstrated mastery and the opportunity to work at a pace aligned with their own learning needs, which combines elements 1, 3, 4, and 5 in the list above (e.g., Levin & Patrick, 2019). Although elements 4 and 5 explicitly relate to flexibility, they are distinct components. Element 4 relates specifically to the flexibility students possess to advance at their own pace, whereas element 5 suggests that pace is not singular. Levin & Patrick (2019) unpack element 5 and explain: "Varied pacing does not imply that there is a single learning pathway that students simply navigate at different speeds. Each student's pace of progress matters."

The Aurora Institute provides a clear overview of what flexible pacing is and is not. In practice, flexible pacing allows instruction to look a little or a lot different for individual students. In some instances, teachers provide the same lesson content to all students but will allow them to demonstrate mastery at different times. In other versions, teachers provide instruction on the same topic but enable students to explore the topic more or less deeply depending on their level of interest and ability to achieve competency in a set amount of time. In both instances, students are asked to manage their own learning progression with some guidance from their teachers but without explicit instruction on specific content occurring at a set pace or timeline. Flexible pacing is commonly misunderstood to suggest a lack of structure; however, Wright (2020) clarified this misconception stating, "flexible pacing should be viewed as a team mentality where the student and teacher are working together (pacer + runner) to

determine the appropriate learning schedule (pace) and structure (choice). All students are running the same or similar race, but their checkpoint timeline and strategy will be different." While flexible pacing is foundational to CBE, previous research has documented that it is the least frequently observed CBE component in practice. In the next section, we discuss the facilitators and barriers to flexible pacing reported thus far in the literature.

Implementing Flexible Pacing: Barriers and Facilitators

Challenges to adopting flexible pacing have been more widely documented in the literature. Previous research (e.g., Evans & DeMitchell, 2018; Evans et al., 2019) has demonstrated that flexible pacing is the least rigorously followed practice in CBE implementation and suggests that this is because it presents too great a deviation from traditional and current schooling practices. Challenges include normative expectations for schools and how schools "should" operate according to conventional schooling orthodoxies. This is evident in multiple studies that highlight common challenges faced by teachers. For instance, pressure from students, parents, peers, and administrators to advance students to the next grade, even when they have not achieved mastery of the required content (Steiner et al., 2017), creates challenges for teachers' enactment of flexible pacing. Teachers also struggled with elements of flexible pacing that run counter to their own beliefs about work habits and grading, in which good work habits are defined as meeting deadlines and turning work in on time—two elements of "typical" schooling that must be relaxed when implementing flexible pacing (Scheopner Torres et al., 2018; Steele et al., 2014; Stump et al., 2018). Indeed, Evans et al. (2019) argue that these challenges to the traditional idea of schooling make administrators less likely to implement more challenging components of CBE, such as flexible pacing.

The extant literature provides evidence of ways districts have facilitated flexible pacing. These factors include adequate professional development (e.g., Evans & DeMitchell, 2018; Evans et al., 2019; Stump & Silvernail, 2014), the availability of technology, and utilization of an learning management system (LMS) (e.g., Evans & DeMitchell, 2018; Stump & Silvernail, 2014; Stump et al., 2017), and the development of shared expectations for grading and proficiency (e.g., Steele et al., 2014). Schools have also adopted structures, such as credit recovery, robust reassessment policies, and the use of online curricula to create opportunities for flexible pacing (Scheopner et al., 2018; Stump & Silvernail, 2015; Steiner et al., 2017). Blended learning and dual enrollment programs can also facilitate flexible pacing; however, developing partnerships between local districts and post-secondary institutions comes with its own challenges, including but not limited to proximity, availability, and resources. Technology and LMSs can also alleviate some teacher concerns and facilitate flexible pathways (Stump & Silvernail, 2014). In addition, LMSs are crucial in making student data readily available to teachers and students, which is necessary to understand and progress their learning. Finally, flexible pacing is better facilitated by curricula without

rigid pacing guides and incorporates flexibility for multiple learning paces (Evans & DeMitchell, 2018; Steiner et al., 2017). Furthermore, to successfully implement CBE and flexible pacing, teachers must be given opportunities to collaborate so they can work together to differentiate content and learning activities for multiple student paces (Evans & DeMitchell, 2018; Pane et al., 2017; Steiner et al., 2017, Stump et al., 2017; Stump & Silvernail, 2014).

While these school and district actions facilitate flexible instructional pacing, the current literature does not address how larger-scale changes (e.g., curating schedules) within schools may also enable flexible pacing in CBE settings. Additional detail about why flexible pacing creates such a challenge for CBE implementation, factors that can mitigate these challenges, and strategies to optimize flexible pacing warrant further elucidation.

CONCEPTUAL FRAMEWORK

The empirical literature discussed above clearly outlines many of the challenges and some of the facilitators to implementing flexible instructional pacing as a part of CBE. While many challenges speak to how CBE and flexible pacing run up against traditional K-12 schooling orthodoxies, we follow Tyack and Tobin (1994) and formalize this concept as "the grammar of schooling."

The Grammar of Schooling

The literature is rife with examples of how difficult it is to implement, sustain, and scale reforms that challenge the status quo in education (e.g., Cuban, 1993; Hargreaves & Goodson, 2006; Honig, 2006; Tyack & Tobin, 1994). Scholars have posited several reasons for the difficulties encountered by educational reformers in their efforts to change the established structure of schooling (e.g., resistance to innovation, normative beliefs, inevitable dilution from the statehouse to the individual classrooms) (Coburn, 2001, 2004, 2005; Cuban, 1993; Datnow, 2000; Hargreaves, 1994; Lortie, 2020; McLaughlin, 1987; Spillane, 2004; Spillane et al., 2002; Tyack & Cuban, 1995; Weatherly & Lipsky, 1977). In this section, we reflect on Tyack and Tobin's (1994) grammar of schooling as a lens to better understand the challenges CBE pilot districts faced when trying to implement flexible pacing. The grammar of schooling is best understood as the organizational framework (e.g., structures and rules) by which schools are standardized. These organizational structures include but are not limited to "dividing time and space, classifying students, allocating them to classrooms, and splitting knowledge into subjects" (Tyack & Tobin, 1994, pp. 454). The grammar of schooling reflects how K-12 public schools are standardized and provide an operationalized definition of what a "quality school," look like or at least the look of a "typical school." Over time, these principles have proven resilient, with a large body of literature documenting how reforms intended to shift or change the base structure of K-12

education have been stymied (e.g., Cuban, 2020; Marsh et al., 2020; Mehta & Datnow, 2020). The durability of the grammar of schooling is especially pertinent to reforms such as CBE, which challenge traditional assumptions of where, when, and how students learn. For example, in a CBE setting, students are bound by mastery of learning targets and not measures of time. The flexibility inherent in the CBE framework explicitly challenges the concept of standardization and replicability that is foundational to the grammar of schooling.

In our analysis, we draw on two primary components of the grammar of schooling that run counter to the use of flexible instructional pacing—the dividing of time and space and the allocation of students to classrooms. We connect these components to school schedules and pacing guides to understand better the challenges districts encounter attempting to create flexible pacing. Additionally, we relate these components to specific school structures to better understand how they differ across grade levels.

DATA AND METHODS

Study Context

Competency-Based Education in Michigan

Michigan is enacting three programs to help further develop competency-based education. First, the Michigan Department of Education (MDE) allocated seed funding and provided technical assistance and support to seven pilot districts that were grantees of funds (labeled 21j funds) issued in the state's 2017–2018 School Aid Act. Second, Governor Rick Snyder—who was governor from 2011 to 2019—established Michigan's Marshall Plan for Talent in 2018 to help ensure that Michigan's education and business infrastructures are more appropriately aligned and that students are prepared for forecasted career opportunities in the state. A vital aspect of this plan is further attention to and investment in CBE. These two actions come with a substantial financial investment, including $500,000 in CBE grants to districts in the FY 2018 State School Aid Act, with a continuing investment of $500,000 for FY 2019 and $2,000,000 in grants to districts to support CBE and programming in the state's Marshall Plan for Talent. There is also $450,000 allocated in the Marshall Plan to the MDE to support competency-based learning in Michigan, including capacity-building infrastructure to support the implementation. Third, in its 2018 legislative session, the Michigan Legislature introduced House Bills 6314 and 6315, which together were intended to increase access to seat-time waivers for districts by granting broad exemptions to a set of "Public Innovation Districts" that commit to developing and implementing an instructional system for diagnosing student needs and providing innovative, differentiated instruction.

In 2017, the state launched its CBE program on a pilot basis. Eighteen school districts applied for the CBE grants funded by the State School Aid Act. MDE assessed the

proposals based on set criteria, including evidence of the use or development of (1) multiple and innovative methods to determine pupils' achievement of grade-level competencies; (2) student-driven projects; (3) formative assessment systems; (4) innovative partnerships with employers or institutes of higher education; (5) transition to a competency-based system of student promotion; (6) high-quality professional development for educators; and (7) continued participation in the statewide assessment and accountability systems. Additional grant review considerations included addressing educator evaluation considerations, district capacity for implementation, data collection and reporting plans, planning and timelines, budgets, commitment from leadership, the rationale for making the shift, and the support of the local board and community. Finally, MDE considered districts' ability to articulate a vision for shifting practices to represent relevant instruction in settings conducive to student learning and the application of knowledge through innovative methods. Based on these criteria, MDE selected seven school districts to receive awards in March of 2018 for use in the 2019–2022 school years. The CBE pilot program provides these initial seven school districts with the flexibility to depart from traditional standards-based instruction and instead implement CBE programming. The seven approved pilot districts are detailed in Table 1. We changed districts' names to protect respondents' anonymity.

Though Michigan's CBE pilot districts are like others across the state in many ways, a few key differences may influence districts' ease in implementing a competency-based system and/or limit the generalizability of our results to other districts. Pilot districts tend to have lower proportions of students of color and English learners. Of the seven pilot districts, Lehigh is the most representative of the state in terms of student racial composition and English learners. At the same time, Williams-Battier, Dawkins-Hurley, and Scheyer-Smith are the least representative. Teachers within the pilot districts are, on average, more experienced than the average teacher statewide and more likely to possess a degree higher than a Bachelor's; this is particularly true for Dawkins-Hurley and Mercer. Given these considerations, the experiences of Michigan's CBE districts may differ from those of the average Michigan school district when implementing CBE practices.

At the time of data collection, these pilot CBE efforts were localized and in the early stages of implementation; the Aurora Institute classifies Michigan's CBE work as "emerging," meaning districts have shown limited evidence of systematic embedding of CBE practices (Levin, 2022). In the 21j districts, CBE practices most commonly were adopted in specific grade levels, content areas, or schools. Moreover, each of the CBE pilot districts that received support from MDE approaches the transition to CBE differently, as might be expected, given that the shift away from standards-based/seat-time to competency-based approaches necessitates a set of local priorities and decisions (Colby, 2019). Some of these differences are apparent in the individual district grant applications; districts differ in the grades and content areas targeted for transition, timelines, spending plans, and the language they use to describe their CBE transitions. Funding use varies by district and includes components such as staffing, local program development, and implementation, professional

development, instructional support services, and leveraging national experts. For all the variations in districts' CBE plans, however, every 21j district's CBE plan shares the common and central use of flexible pacing to enable students to receive individualized instruction and create opportunities for deeper learning. In our qualitative data collection section, we provide descriptions of our case districts' practices and policies related to flexible pacing.

Table 1. Descriptive Characteristics for 21j Pilot Districts

	State-wide	Williams-Battier	Dawkins-Hurley	Lehigh	Carrawell-James	Davis	Scheyer-Smith	Mercer
Participated in survey		Yes	No	Yes	No	Yes	Yes	Yes
Case studies		No	No	Yes	No	Yes	No	Yes
Students								
Special education	14.2%	11.3%	10.6%	14.7%	13.1%	11.8%	11.8%	13.2%
English learners	7.0%	0.4%	0.0%	8.2%	0.4%	0.0%	0.6%	2.8%
Economic disadvantage	52.7%	59.3%	30.0%	52.1%	36.3%	37.6%	23.9%	49.1%
Black students	17.9%	0.6%	0.3%	4.7%	0.6%	0.0%	0.1%	14.4%
Hispanic students	8.1%	1.7%	2.6%	17.1%	6.6%	4.9%	1.7%	3.1%
White students	65.7%	94.0%	94.0%	69.4%	89.8%	88.6%	95.7%	73.8%
Other race/ethnicity	8.4%	3.6%	3.1%	8.8%	2.9%	6.5%	2.5%	8.8%
Teachers								
Early career teachers (first 3 years)	15.2%	14.5%	10.5%	7.8%	14.5%	31%	10.6%	8.0%
Master's degree or higher	55.7%	59.1%	57.1%	64.6%	62.4%	11.8%	76.1%	76.5%
N (students)	1,479,706	3778	1071	3085	2812	263	1756	4968
N (teachers)	85,104	200	61	175	164	16	88	272
Ratio	17:4	18:9	17:6	17:6	17:1	16:4	20:0	18:3

Note: We used pseudonyms for all school districts, as well as for individual schools and participants

A Mixed-Methods Approach to Understanding the Implementation of Flexible Pacing in Michigan

The data for this paper come from a mixed-methods study examining the implementation of CBE programs in five of the seven 21j districts across the state of Michigan. This more extensive study, undertaken in partnership with MDE, was intended to develop an understanding of specific ways individual districts implement CBE in Michigan, with implications for districts across the state and the country.

We employed a concurrent triangulation design to evaluate the implementation of CBE in Michigan's 21j pilot districts. Concurrent triangulation design is a one-phase design strategy, which involves "the concurrent, but separate, collection and analysis of quantitative and qualitative data so that the researcher may best understand the research problem. The researcher attempts to merge the two data sets, typically by bringing the separate results together in the interpretation or by transforming data to facilitate integrating the two data types during the analysis" (Creswell et al., 2003, pp. 62–64). Employing this design, the research team, consisting of four researchers, coordinated the development of instruments (e.g., surveys, interview protocols) and data collection in terms of timing, topics, and content. We then collected the survey and interview data and performed an initial set of analyses independently by data type. Then the research team discussed preliminary findings, highlighting areas of convergence and divergence in the data. The research team then returned to the datasets for secondary data analyses probing themes that had emerged in one or the other data sets. In the end, both data sources were used to confirm and disconfirm our assertions. By integrating analyses of varied sources of qualitative and quantitative data, we were able to paint a rich picture of flexible pacing across Michigan's 21j districts and schools.

This research was conducted during the 2019–2020 and 2020–2021 school years. Like other studies, COVID-19 and subsequent school building closures did impact our data collection. Before the school building closures in March of 2020, we conducted interviews with administrators and our initial teacher interviews. Although the second interview occurred during the COVID-19 pandemic, our initial interview had already focused on pre-pandemic conditions. Therefore, we chose to follow our existing emerging analysis rather than pivot to concerns regarding CBE and COVID-19 and focused our conversations with teachers on the pre-pandemic implementation of CBE.

Survey Data and Methods

Quantitative data for this research are drawn primarily from survey instruments developed in early 2019 and administered to teachers in five of Michigan's seven CBE pilot districts in the fall of 2019. Two pilot districts declined to participate in the survey portion of this implementation study, citing leadership transitions and timing concerns. We designed the surveys to capture eight core components of CBE

implementation in Michigan: educator professional development and support, the profile of a graduate, measurable competencies, formative assessment, personalized instruction, student agency, project-based learning, and competency-based credentialing. Many of these components are further divided into content domains describing different aspects of the element, with separate survey questions designed to target each specific domain. In addition, teacher surveys captured background information about teachers and details about job satisfaction, instructional practices, and attitudes toward CBE.

The survey instrument includes a combination of existing items from publicly available CBE surveys and unique items that the research team developed to address a particular content domain. We gathered written and verbal feedback through a series of focus groups with teachers to validate and finalize the survey instrument (EPIC, 2021). The surveys enable us to explore CBE implementation from the ground level, capturing teachers' dispositions and actions related to the core components. In this paper, we focus primarily on survey items related to flexible instructional pacing. These include several items about personalized instruction more generally, which can take the form of flexible pacing, personalized content, or differentiation in the depth of instruction as appropriate given an individual student's needs. For additional insight into how teachers approached these practices and what support they received, we also include survey questions about student competencies and teacher professional development.

We administered surveys digitally between November 2019 and January 2020, providing a unique URL to individual respondents. Due to technical challenges within some buildings, we offered a subset of schools with paper surveys for students to complete, which we then collected and digitized such that they could be merged into a complete survey response dataset. Table 2 provides overall response rates for each of the five participating districts. The comprehensive teacher response rate was 73% (N = 444/611), with individual district response rates ranging from 54 to 91%.

Table 2. Teacher Response Rates by CBE Pilot District

District	Responses	Target Population	Response Rate (%)
Williams-Battier	59	80	73.8
Scheyer-Smith	52	91	57.1
Davis Charter	13	24	54.2
Mercer	222	243	91.4
Lehigh	98	173	56.6
Overall	444	611	72.7

The teachers who responded to our surveys largely represent the overall population of teachers in the five participating districts, along with observable characteristics. Table 3 shows that the only ways our response sample significantly differs from the overall population on observable characteristics are: (1) the over-representation of

elementary self-contained classrooms; and (2) the over-representation of teachers not providing a grade level ("unknown" on Table 3).

To analyze the survey data, we examined descriptive statistics for individual survey items. The survey items we focus on in this paper are all scored on 4- or 5- point Likert scales, most commonly asking respondents to rate their level of agreement by selecting one of the following four categories: strongly disagree, disagree, agree, or strongly agree. The remaining items in our analysis are scored either on a 5-point scale describing the frequency with which something occurs (never, less than monthly, monthly, weekly, or daily) or a 4-point scale describing the usefulness of a particular activity (not at all useful, somewhat useful, mostly useful, or very useful, with an option to indicate that they did not partake in the activity at all and therefore cannot rate its usefulness). For each item, we calculated the relative frequencies of each response option. In some cases, we combined "strongly disagree" and "disagree" responses into a single category and did the same with the "agree" and "strongly agree" responses, allowing us to compare the rates at which teachers agreed or disagreed with a particular item prompt (regardless of how strongly they agreed or disagreed). We weighted all frequencies by the inverse of the number of non-missing responses within a given district, such that each district (and not teacher) is weighted equally, and results can be interpreted as the average across districts. We ran these analyses on both the full sample and individual pilot districts, allowing for observations of average effects and potential heterogeneity between districts.

Qualitative Data and Methods

Selection of Case Districts

We invited three of the five 21j districts to participate in case studies from the more extensive set of five pilot districts that participated in our surveys: Lehigh Public Schools, Mercer Public Schools, and Davis Charter High School. We selected these districts for several reasons. First, these districts represented different student populations, with Mercer and Davis serving fewer disadvantaged and English Language Learners than Lehigh. Second, districts also varied by size, with Mercer serving a student population more than ten times Davis' and one-third larger than Lehigh. Third, these districts vary by governance model, including both traditional public schools and a recently constituted charter school.

Finally, CBE was uniquely embedded in each of these districts—in Mercer, implementation efforts were more consistent at the secondary level; in Lehigh, the district was attempting to implement CBE across all grade levels; and at Davis Charter School, CBE was part of the schools' original charter.

Table 3. Comparing Observable Characteristics of Survey Sample and Target Population			
Observable Characteristics	**Target Population (%)**	**Survey Sample (%)**	**Difference (%)**
Gender			
Female	73.6	75.2	1.6
Teacher department			
Elementary subjects	29.9	34.5	4.6*
ELA	10.9	11.5	0.6
Math	9.7	10.6	0.9
Science	9.4	9.2	−0.2
Social studies	8.4	8.3	−0.1
Special education	7.1	4.7	−2.4
Physical education	4.9	3.6	−1.3
CTE	4.4	4.3	−0.1
Fine arts	4.4	3.8	−0.6
World languages	3.1	3.4	0.3
Intervention	3.0	2.5	−0.5
Music	2.0	1.6	−0.4
Other	2.8	2.0	−0.8
Race/ethnicity			
American Indian or Alaska Native	0.5	0.7	0.2
Asian	0.4	0.5	0.1
Black or African American	0.2	0.2	0.1
Native Hawaiian or Pacific Islander	0.2	0.2	0.1
Two or more races	0.5	0.2	−0.3
Unknown	0.2	0	−0.2
White	98	98	0
Teacher grade level			
K–2	16.9	14.3	−2.6
K–5	0.7	0.5	−0.2
3–5	14.9	13.3	−1.6
6–8	13.3	11.5	−1.8
9–12	3.8	5.1	1.3
All	3.2	3.8	0.6
Multiple	46.4	48.4	2.0
Unknown	0.9	3.1	2.2

*Note: Significance calculated using sample tests of proportions. *p < 0.05*

Descriptions of Districts' Efforts to Support Flexible Pacing

As described above, we selected case districts for participation in a larger study of CBE practices. The three case districts varied in the ways they approached flexible pacing.

Mercer Public Schools. CBE implementation efforts in Mercer primarily focused on the development of competencies and the adoption of a district-wide LMS, which are both foundational to supporting flexible pacing. In addition, Mercer Public Schools had several policies explicitly intended to foster flexible pacing. First, the district developed an advisory period at the middle and secondary levels, which created protected time for students to meet with teachers of their choosing for additional support, remediation, and reassessment. These advisory periods served multiple purposes beyond pacing; in addition to providing academic intervention, advisory also served as a space for students to engage in social-emotional learning activities and develop skills and dispositions (e.g., goal setting, self-assessment) required to be effective learners in a competency-based system. Second, the school created more flexibility for deadlines and student assessments and no longer penalizes students for missed deadlines.

Lehigh Public Schools. Efforts to incorporate flexible pacing in Lehigh have gained limited traction system-wide. However, there is ample evidence of practices and policies being enacted in individual schools and classrooms. At the district level, Lehigh implemented a daily advisory program, flexible deadlines, and assessment schedules, adopting Canvas as an LMS. Additionally, the district instituted multiple academic support days throughout the school year, where students working below pace have the entire day to meet with their teachers and receive targeted support. At the classroom level, teachers have developed practices around "sharing students" or fluid ability grouping—all of which have been dependent on scheduling, proximity, and teacher collaboration. At the elementary level, teachers have also incorporated "What I Need Time" (WIN Time), where teachers intentionally block off time during the day for students to choose what learning activities or assignments they want to work on.

Davis Charter School. Like the other case districts, Davis Charter School has implemented an advisory program and implemented and utilized a schoolwide LMS; however, what makes Davis' efforts unique is their emphasis on flexibility in their schedule. Davis students attend classes Monday-Thursday, with Fridays set aside for students to make choices regarding the classes and projects they work on. Additionally, Davis has created a first-year academy and schedules these classrooms at the same time and on the same hallway. This facilitated the sharing of students and created opportunities for flexibility for students regarding what class or work they choose as their focus.

Teacher Participants

We recruited 37 teachers across the three districts, and three teachers withdrew from the study prior to the first interview. Participating teachers included elementary, middle, and secondary teachers who teach various subjects. Reflecting the larger

population of teachers (both in our sample and nationally; Goldhaber et al., 2019), our sample included almost exclusively white teachers. Table 4 summarizes the participant demographics for each site. Districts, schools, and teacher names have all been de-identified to provide anonymity for all participants. We recruited participants via in-person presentations during staff meetings and recruitment emails sent by principals and department heads. Given educators' substantial time investment in the study (detailed below), the research team provided participants a $100 stipend in appreciation for their time and commitment.

Data Collection

Teachers participated in two semi-structured interviews—one during the fall of 2019 and a second during the spring of 2020. Each interview lasted approximately 75 minutes. The interviews generally took place in the participants' classrooms or coffee shops, or restaurants near where the participants lived. When participants were unavailable to meet in person, interviews were conducted over the telephone. All second interviews in spring 2020 were conducted remotely, via Zoom or telephone, due to COVID-19 safety protocols.

The initial interview focused on teachers' understanding of CBE and their districts' reform vision, their evaluation of their districts' implementation efforts and effectiveness, and how they have adopted or aligned their existing pedagogy to CBE. See Appendix 1 for the full interview protocol. The second interview provided a space for teachers to discuss in depth the challenges they faced incorporating CBE strategies and the availability and effectiveness of support they relied on to mitigate these challenges. The initial interview focused on pre-pandemic conditions, and we continued that line of inquiry in the second interview. All data were transcribed verbatim and uploaded into the online qualitative data analysis tool Dedoose.

Data Analysis

As the first step in the data analysis procedures, we conducted multiple readings of the data across and within case districts, grade levels, and subjects. In addition to initial impression formation during the data readings, we regularly contributed to a series of memos about data collection and the emerging analysis based on interviews. These memos took one of two formats: reflective or analytic. Reflective memos served as a space to examine issues of subjectivity and researcher positionality. Analytic memos examined connections between these data and existing theories, literature, and frameworks related to CBE. The analytic memos served as a space to develop emerging assertions about these data under which codes would eventually be grouped. Finally, we utilized a hybrid coding scheme, drawing on deductive codes derived from the literature on CBE and its assumptions (Crabtree & Miller, 1992) and inductive codes that emerged from the data (Merriam, 2002; Ravitch & Carl, 2019). Our analysis included both single-case and cross-case analysis, coding across site districts, grade levels, and classrooms. The coding process yielded 16 codes that related to whether there were opportunities for flexible student pacing and students to advance once they demonstrated mastery of a learning competency.

Table 4. Teacher Participant Demographics				
Participant	**District**	**Building**	**Yrs. Teaching**	**Subjects Taught**
Lola	Lehigh	Dunleavy Elementary	1–5	Elementary
Candice	Lehigh	Dunleavy Elementary	6–10	Elementary
Hannah	Lehigh	Dunleavy Elementary	21 +	Elementary
Allison	Lehigh	Dunleavy Elementary	6–10	Elementary
Ginger	Lehigh	Dunleavy Elementary	21 +	Elementary
Julia	Lehigh	Dunleavy Elementary	16–20	Elementary
Spencer	Lehigh	Dunleavy Elementary	1–5	Elementary
Mark	Lehigh	Dunleavy Elementary	16–20	Elementary
Elizabeth	Lehigh	Dunleavy Elementary	21 +	Elementary
Joanie	Lehigh	Laettner-Hill High	21 +	STEM
Benjamin	Lehigh	Laettner-Hill High	21 +	Humanities/Social Science
Samantha	Lehigh	Laettner-Hill High	16–20	SPED
Bryan	Lehigh	Laettner-Hill High	11–15	STEM
Carrie	Lehigh	Williamson Middle	16–20	STEM
Maya	Lehigh	Williamson Middle	11–15	STEM
Lawrence	Lehigh	Williamson Middle	16–20	World Languages
Alexandra	Lehigh	Williamson Middle	21 +	Humanities/Social Science
Emily	Lehigh	Williamson Middle	11–15	Humanities/Social Science
Tim	Lehigh	Williamson Middle	6–10	STEM
Daniel	Lehigh	Williamson Middle	6–10	STEM
Jesse	Lehigh	Williamson Middle	11–15	Humanities/Social Science
Amelia	Davis	Davis Charter High	6–10	World Languages
Phillip	Davis	Davis Charter High	6–10	STEM
Violet	Davis	Davis Charter High	6–10	Career and Technical
Rachel	Davis	Davis Charter High	6–10	Humanities/Social Science
Donovan	Davis	Davis Charter High	6–10	Humanities/Social Science
Jennifer	Davis	Davis Charter High	1–5	Humanities/Social Science
Maggie	Mercer	Winslow High	1–5	Humanities/Social Science
Andrew	Mercer	Winslow High	11–15	Humanities/Social Science
Maeve	Mercer	Winslow High	21 +	Career and Technical
Claire	Mercer	Winslow High	1–5	Humanities/Social Science
Noah	Mercer	Winslow High	11–15	STEM
Miranda	Mercer	Barrett Elementary	6–10	STEM
Anna	Mercer	Barrett Elementary	16–20	Humanities/Social Science
Evelyn	Mercer	Barrett Elementary	6–10	STEM

Using Dedoose, we created three parent codes: challenges, practices, and facilitators. As part of the challenges and facilitators parent codes, we also developed child codes

such as challenges: personal/self, challenges: department/grade level, and facilitators: resources. In Appendix 2, we provide an excerpt from our code book, including code definitions. We used these codes to support or provide disconfirming evidence to support our assertations.

Triangulating Survey and Interview Data

The research team met regularly throughout data collection and analysis to discuss emerging findings. Upon completing the data analysis, we reviewed the interview and survey data conclusions. From there, we discussed how these data provided confirming and disconfirming evidence of our assertions.

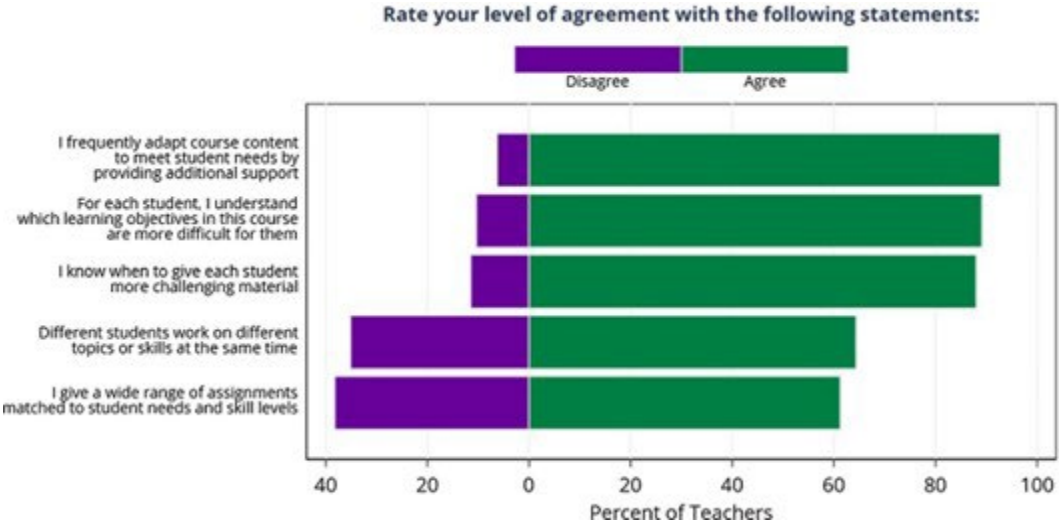
FINDINGS

We separate this section into two parts: The first discusses teachers' enactment of flexible pacing. In the second section, we examine two significant barriers to flexible pacing that emerged in our data: scheduling and pacing guides.

Teacher Enactment of Flexible Pacing and Advancing Upon Mastery

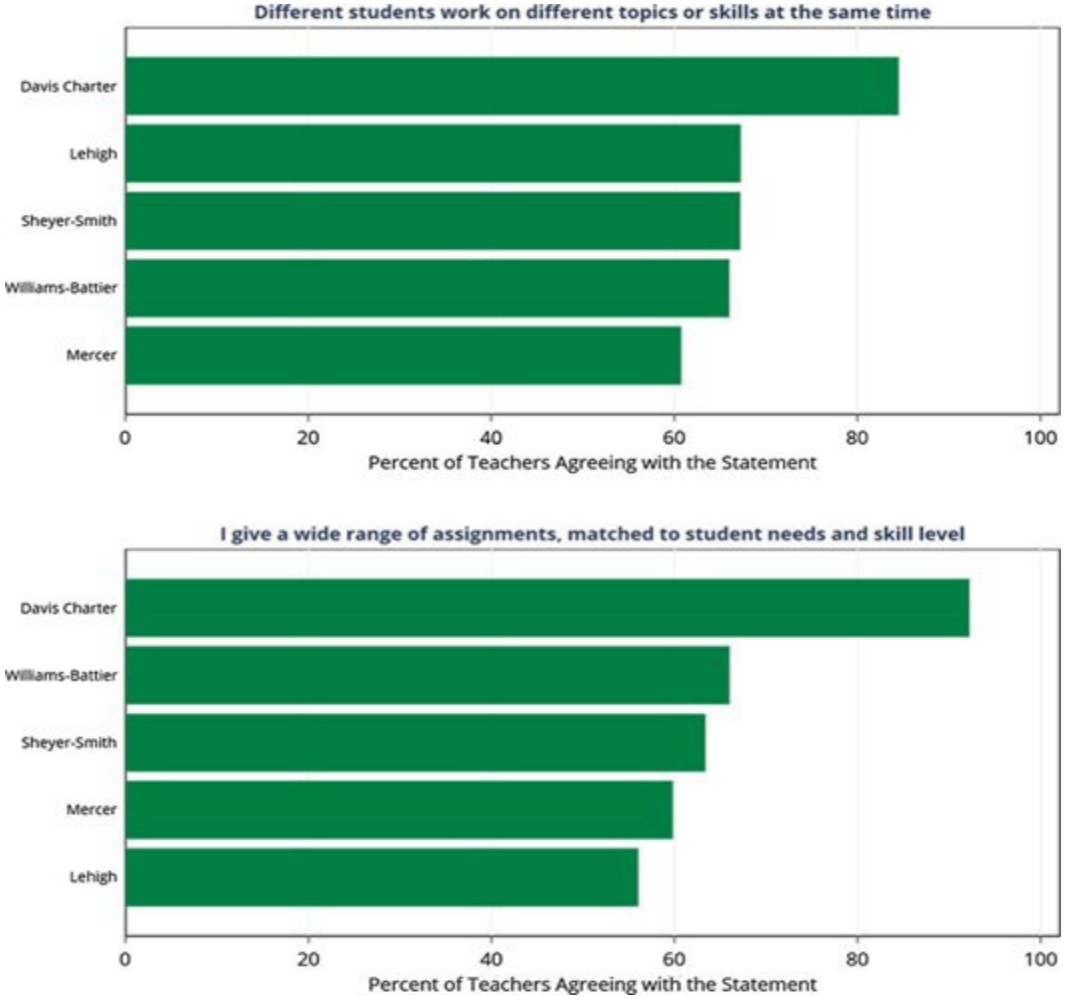
Survey data suggest that teachers in Michigan's CBE districts believe they are targeting instruction to students' needs. For instance, teachers overwhelmingly report that they know when to give a student more challenging material, know which learning objectives are difficult for a particular student, and frequently adapt their courses to meet students' needs. As is shown in Figure 1, when presented with these statements individually, over 90 percent of teachers agreed with each one. These items reflect teachers' beliefs that they understand their students' needs and are able to personalize instruction, which is necessary if they are to enable flexible pacing.

Figure 1. Teachers' Implementation of Personalized Instruction



There is less agreement, however, amongst teachers about the actual implementation of flexible pacing, as shown in the bottom two items in Figure 2 that measure teachers' enabling different students to work on different topics or skills at the same time and providing assignments matched to a given student's needs and skill level. Thus, teachers' survey responses suggest a high prevalence of personalized instruction throughout CBE districts, though this may come in forms other than flexible pacing, such as personalized content. When we break down survey responses by district, we see that they fall largely in line with sample-wide averages and that this is consistent across case sites and non-case site districts. However, teachers from Davis Charter High School indicated higher levels of agreement across all survey items targeting personalized instruction. This is most prominent when considering prompts on the variety of assignments provided and the alignment of those items to the individual students' skill levels, to which only one respondent responded in the negative. This finding may be due in part to the smaller sample size for Davis CHS (13 teachers) but is more likely a product of the district's charter, which is founded on a competency-based learning model. Those two items, broken down by district, can be seen in Figure 2.

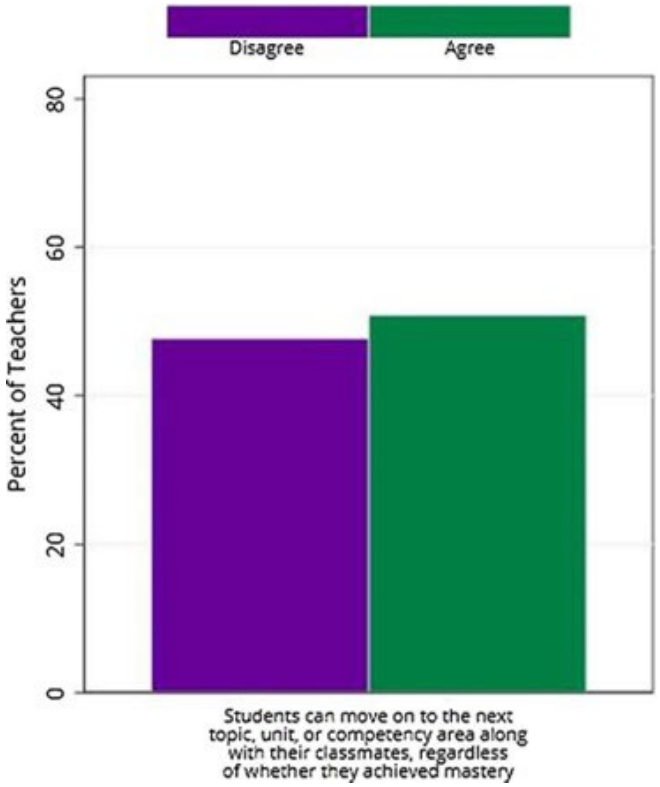
Figure 2. Key Personalized Instruction Items by District



However, both survey and case data suggest that students can progress even if they have not achieved mastery of specified competencies. Indeed, teachers report that they often establish competencies within their classrooms on which students must demonstrate mastery; however, mastery is not a requirement for advancement. This is shown in Figure 3; approximately 80% of teachers report creating measurable competencies, but more than half of the teachers surveyed agreed that students could move on to the next topic, unit, or competency area regardless of whether they achieved mastery. Thus, while districts are creating measurable competencies, established competencies serve more as goals to strive towards than requirements for students to advance to the next competency.

Similarly, analyses of our case data suggest that, regardless of whether students achieve mastery not, they are advancing to the next topic or competencies. The evidence from the case studies suggests that once students reach mastery of a specific skill or topic, they are not allowed the flexibility to continue to self-pace to delve deeper into a topic or to move on to the next competency without their classmates. Interview items that asked teachers to reflect on instructional pace received emphatic answers. For instance, Joanie, a STEM teacher at Laettner-Hill High School in the Lehigh Public School District, explained that the school operated as 100% teacher-paced, noting "we are way teacher paced."

Figure 3. Measurable Competencies



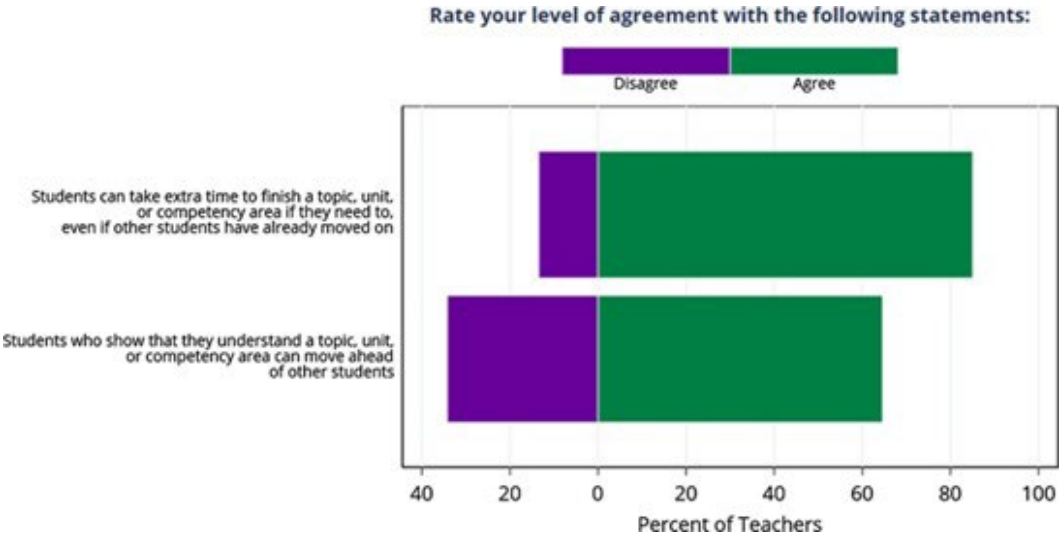
Teachers in other case districts spoke to the disconnect between CBE systems' expectations for flexible pacing and current pacing practices. For example, Maggie, a humanities and social science teacher at Winslow High School in the Mercer Public School District, explained the disconnect between the expectations for pacing in a competency-based environment and the reality in classrooms. Maggie explains:

> *Everyone is on the same page at the same time. There is no 'well, you've already mastered this. You're going to move on to this. There—you know, you've demonstrated this. Now let's increase the difficulty level' or scaffolding of, um, knowledge.' In my opinion, what I've seen and what I've heard, and that's not happening.*

Overall, classroom instruction in Mercer and Lehigh primarily operates at teacher pace without opportunities for advanced students to participate in self-pacing or deeper learning.

In the cases where core classroom instructional time does not provide opportunities for flexible pacing, it may be that teachers are better able to provide opportunities for remediation through the CBE framework than for pushing towards and through mastery. To that end, survey data suggest that teachers are more likely to offer students opportunities to catch up as opposed to jump ahead. Figure 4 shows that 86 percent of teachers offer their students extra time to finish a topic, unit, or competency when needed, even as other students move forward, whereas fewer teachers—65 percent—say that they permit students to advance ahead of their classmates.

Figure 4. Personalized pacing—remediation versus advancement



Together, these data show that teachers report understanding the specific needs of their individual students, and many work to provide flexible pacing opportunities. However, traditional pacing structures are still present in our included districts; students often are allowed to move through a competency even if they have not yet

demonstrated mastery. Moreover, when flexible pacing is implemented, it is more often for remediation than for acceleration, indicating that students often must wait for the class to move forward rather than pushing ahead at their own pace.

The Grammar of Schooling and Flexible Pacing

The previous section suggests that teachers want to incorporate flexible pacing but have difficulties. Here we view these data through the conceptual lens of the grammar of schooling to understand barriers and facilitators to flexible pacing.

Schedules and Time

The division of time and space, or the creation of school schedules and siloed classrooms, is a core component of the grammar of schooling. At the elementary level, the traditional schedule makes adopting strategies that facilitate flexible pacing easier to implement. Because elementary schedules rely less on transitions and core instruction is generally limited to one classroom, elementary teachers report feeling far less constrained by the daily schedule. Overwhelmingly, the elementary school teachers we spoke with expressed gratitude that, except for electives, their students stayed with them throughout the day, which increased their ability to create more flexible learning environments. For Evelyn and Anna, teachers at Barrett Elementary in Mercer, the self-contained nature of their classrooms allow them to easily extend learning activities and make decisions about activities based on where their students were in the learning versus what the daily schedule would allow. At Dunleavy Elementary in Lehigh, the lower elementary grade teams use their shared common schedule to easily share students and create fluid ability groups, which increased students' opportunities to learn at their own pace. Hannah explains:

> *To better pinpoint needs, we divided our kids up based on different data points. And, um, you know, one teacher took the kids that could move a little faster. Another teacher had the kids at grade level. And another one, you know, the kids who needed more time. And then, we had the interventionist as well pulling kids at that same time. And they're fluid groups where, you know, if all of a sudden, a child's making gains, then, they would move up to the, you know, teaching, um, going at a faster pace. Or same, you know, if someone was not keeping up and needed even more time, they would, you know, go down.*

Hannah and other members of her grade team recognize that the level of flexible pacing they can offer their students is in direct relation to how in sync their schedules are. While the traditional schedule facilitated flexibility at the elementary level, it complicates implementation at the middle and secondary levels.

At the middle and secondary levels, teachers report that schedules were a significant barrier to enacting strategies that supported flexible pacing, such as creating a "student share," where students move between classrooms in the same content area as their

current learning pace dictates. Our qualitative data highlight examples of fortuitous and intentional scheduling, which enable teachers to create flexible pacing.

Fortuitous Scheduling

Tim and Maya, two teachers at Williamson Middle School in Lehigh, were fortunate to have their 8th grade STEM courses scheduled during the same block, which enables them to share their students. Maya explains:

> *We have more opportunity probably to rearrange our kids between each other than our colleagues. To what end? Are we just gonna split 'em into, now I have the kids that are going faster and he's going slower? We can only do that a couple hours of the day that we actually both have eighth graders at the same time.*

Notably, scheduling Tim and Maya's classes at the same time was a fortuitous coincidence and was not explicitly planned by the district or school principal. Thus, although Tim and Maya can create flexibility in their shared classrooms this year, there is no guarantee their schedules will align in the future. While other teachers expressed interest in adopting such a practices, the inability to schedule similar courses reliably and consistently during the same blocks of time makes it difficult. Given the structure of middle and secondary school schedules, teachers in higher grade levels cannot easily extend students' learning opportunities or share students. This is evident in the experience of Daniel, a STEM teacher at Williamson Middle. He explained that while he and the other 7th grade STEM teachers have discussed practices such as sharing students to accommodate students at their individual paces, ultimately, their classes are scheduled at different times. Additionally, Alexandra, a humanities and social science teacher at Williamson, expresses similar concerns, explaining, "because I can't just send kids to Emily or to Lee, all the learning has to happen in my class, and I just am not prepared to teach all parts of my curriculum at once."

Intentional Scheduling

Davis Charter High School engages in more deliberate scheduling. While they primarily operate on a similar traditional schedule as schools in Lehigh and Mercer, the Davis administration intentionally curates their schedule to allow their first-year academy educators to teach the same periods, which enables them to share students and create flexibility between their classrooms. One of the first-year academy teachers, Phillip, explains:

> *Our three classrooms are right in a row and so on certain days students will focus on project building and can choose how they're spending that time. Um, what, how they're, you know, what teacher they're working with. Two of the classrooms open up to each other and then the third one is set aside and so that third one is there for extra support and the other two is more of like a project work, workspace. Um, and so there's a level*

> *of autonomy there within that three-hour block where students will have some choices about how to spend that time.*

In addition to curating schedules, students at Davis also participate in Flexible Fridays, where they choose the classes and teachers they meet with based on their current learning progression. For Rachel, a humanities and social science teacher at Davis, Fridays are a chance for her students to not only receive more one-on-one support but also to be an agent of their learning. Rachel explains:

> *We don't have regular classes on Fridays that's time for students to come in and receive that additional teacher support that they might need, if they are struggling through a project. So, if the student needs more time, they need that more attention, or they need more time to understand the topic, they have the ability to do that. It's their choice.*

Administrators in Lehigh and Mercer intentionally schedule time within and outside the school day to meet students' individual needs. For instance, both districts use daily advisory periods, where students can meet with teachers for remediation or reassessment during the school day. These periods range from between 22 and 30 minutes a day.

In addition to the advisory period, Lehigh uses additional structures such as academic support days, which enable students to have additional time to meet with teachers, receive remediation, and complete reassessments as needed. Lehigh offered these support days once each academic quarter. These days are optional for students currently working at or above teacher pace. The infrequency of the academic support days did not constitute a significant change to the district schedule; however, at the middle school level, the district utilizes an extended day model, which offered a more substantial shift in schedule. Maya, who regularly supervised students during the extended day, recounts its benefits in improving opportunities for students to work at their own pace:

We used to have seventh hour up until this year. It was afterschool tutoring. It was an hour and a half after school, three days a week. There was one teacher, they had enough budgeted to pay one teacher in each of the core subject areas to staff those three days a week. Students could come in and they could retake tests, they could catch up on work. That was huge. An hour and a half is a huge chunk of time—compared to the 22 minutes of advisory each day.

As Maya suggests, the extended day provides more time and better opportunities for flexible student pacing. However, while Maya and other teachers at Williamson support the extended day model, the program was cut due to a lack of funding for instructional and transportation costs.

Although each case district engaged in some intentionality in shaping their schedules to support flexible pacing, it is important to note that Davis did so during their

instructional periods, which ultimately integrated flexibility in their classrooms. In Lehigh and Mercer, on the other hand, they created separate spaces distinct from traditional instructional time.

Pacing Guides and Expectations

As part of the grammar of schooling, schools are divided and organized around the concept of time, which typically translates to schedules; however, the concept of time can also be applied to instructional pace and the rate of curricula coverage. For teachers at the elementary, middle, and secondary levels, the presence of pacing guides and normative expectations related to pacing were significant barriers to enacting flexible pacing. Teachers at every grade level reported using curricula with rigid pacing guides, which ensured that teachers and students stayed on track to cover required content over the course of the school year. Teachers explain that these materials dictate the specific lessons to be covered each day or week, prescribing the assessment content and timing before teachers can move on to the next unit. For the math teachers at Mercer Elementary, this limits their ability to provide flexible pacing in their classrooms. Evelyn explains this disconnect:

> *To us it feels like there isn't any autonomy for us to be like, nope, the kids aren't getting it, so we are gonna—just gonna be days behind. They tell us this every time we say that. The program spirals, and it repeats previous information throughout, but I haven't seen that, personally. They want us to keep pushing forward, keep pushing forward. Like, that's all they tell us is to keep going.*

The push to keep pace with these rigid pacing guides limited teachers' abilities to meet students where they are and provide multiple pathways to demonstrate mastery. For Maya and Tim, who teach 8th-grade science during the same period, their schools' adoption of a scripted curriculum limits their ability to share students. Maya recognizes the quality of the curriculum but also the disconnect between it and the district's larger goals of creating flexible pacing. She explains, *"The program we purchased this year is pretty scripted, but super high quality. We are pretty much on pace with each other day to day."* The highly scripted nature of the program creates a singular pace across multiple classrooms. The combination of the perceived quality of the materials and the substantial resources their districts had invested in curricular adoption compels teachers to follow the pacing guides.

Even when teachers were not utilizing curricula with strict pacing guides, they still commonly worried about being out of sync with their curriculum and emphasized content coverage. The idea of being behind or being off schedule made teachers uncomfortable. For teachers like Claire, a humanities and social science teacher at Winslow High School in Mercer, keeping up with her curriculum was essential to being an effective professional. She spoke at length regarding the tension between trying to provide students with flexible pacing and pressure to stay on pace. Claire explains:

> *We give them several extra weeks to master a competency. However, there's a set amount of curriculum I must get through each semester, so we still have to keep pushing forward the whole class unless it's something that I see, you know, okay, average, nobody in here is understanding this concept.*

Other teachers agree that creating flexible student pacing would be detrimental to their ability to cover their curriculum. Andrew, a humanities and social science teacher at Mercer's Winslow High School, explains that his department was also reluctant to deemphasize coverage in favor of flexible pacing. Andrew explains, *"My department is a little bit stubborn in the fact that they'll turn you to the Michigan high school content expectations for what they need to teach, and they'll say, the state of Michigan tells me I have to teach X, Y, and Z."*

Teachers' attitudes towards content coverage and maintaining teacher pacing were reinforced during administrator walk-throughs, during which administrators note where teachers are in the material relative to where they "should" be. Daniel, a STEM at Williamson Middle School, explains the pressure he feels to meet his administrator's expectations:

> *The only aspect of [{competency-based learning]} that we have is the—it's not you take a test and [{students]} move on. [{Students]} take a test. {Students are} still responsible for that material. [{Students]} are responsible to get the material that is required for that course. The problem is [{teachers]} move on regardless of where everyone in the class is. Then [{teachers are]} just dragging these kids along, trying to get them caught up. They can't slow down because we don't have the ability to slow down.*

These data suggest that the combination of strict pacing guides and teachers' normative beliefs about content coverage created an environment where teachers do not feel they can foster flexibility in their classrooms.

DISCUSSION

In this paper, we worked to develop a deeper understanding of why flexible pacing is infrequently observed in CBE settings. Through our mixed methods study of CBE pilot districts in Michigan, we have identified specific factors contributing to the constraining of teachers' use of flexible pacing.

We found limited evidence that flexible pacing had been implemented at scale within these pilot districts. Currently, the advisory period and extended learning opportunities are the primary way districts have brought flexible pacing to scale; however, these opportunities have largely been designed to help students working below pace, and create no pathways for students working at or above pace to advance

or engage in deeper learning. While districts have largely struggled to implement flexible pacing at scale, we identified individual teachers and grade teams that successfully incorporated flexible pacing within each of our case districts. Successful teachers were able to leverage collaborative relationships with peers to share students and create fluid ability groups. Depending on the district, teachers' success at implementing flexible pacing depended on luck, where they happened to be scheduled to teach the same course during the same period as a colleague, or curation, where teachers were explicitly scheduled to promote collaboration.

Previous implementation studies have identified several barriers to implementing flexible pacing, including but not limited to difficulty consistently defining proficiency (e.g., Stump et al., 2018) and concerns around adopting practices dissimilar to existing classroom practices (e.g., Evans et al., 2019). This study adds to that literature base by describing how structural aspects of a school's operation, such as how the schedule is created or which curricula are adopted, may play an even more fundamental role in creating barriers to flexible pacing. Although such topics as how proficiency is defined and changing historical practices are undoubtedly key, flexible pacing implementations are still unlikely to be successful if deeper logistical factors prevent teachers from collaborating with each other or prevent them from successfully altering pacing to meet student needs. While we present evidence of how the schedule is a structural impediment at the middle and secondary levels, our findings suggest that the traditional schedule facilitated practices that supported flexible pacing at the elementary level. As such, a key conclusion of this study is that traditional school practices and structures are not inherently favorable or unfavorable for flexible pacing implementation, but rather it depends on how these practices are carried out and the impacts they have on teacher collaboration and altering student pacing. Schools that struggle with implementing flexible pacing could benefit from examining how these practices are modified or adjusted, rather than the need to consider wholesale abandonment, at schools where flexible pacing is more successful.

Recommendations for Policy and Practice

There are several steps districts may take to ensure more effective implementation of CBE. At the district level, administrators should closely examine the alignment between the curriculum and districts' broader instructional goals. If districts are trying to implement instructional reforms that emphasize flexible pacing, they should consider curricula that are not accompanied by rigid pacing guides that provide limited opportunities for teachers to differentiate instruction. Additionally, it is incumbent upon districts to select curricula that allow for more student-centered work—work that can be done independently. Time and time again, teachers from case districts expressed concerns about covering content and staying on pacing guides. To alleviate this pressure, administrators should approach walkthroughs and evaluations more holistically and focus not on where teachers are in the curriculum but on how they are employing flexibility for multiple learner paces.

Our findings highlighted that while traditional school scheduling stifled implementation at the middle and secondary level, practices that facilitated flexible pacing flourished under the traditional elementary schedule. While CBE proponents (e.g., Moumoutjis, 2021) advocate for reimaging and redesigning schools, districts should work to identify and differentiate how structures impede implementation efforts across grade levels and consider targeting structural reforms to specific grade levels rather than district wide.

It is also incumbent upon districts to provide professional development opportunities where educators have meaningful opportunities to engage in reflective activities where they can unpack the tension between their own assumptions and expectations for their work and the expectations required in a competency-based learning setting. Again, this professional development would be most beneficial if provided prior to program implementation; teachers should not be simultaneously learning about and implementing new practices.

In a post-COVID-19 world, district leaders are increasingly looking to instructional reforms like CBE. However, the challenges our findings highlight will likely be exacerbated. After two years of atypical schooling, more students will likely be at different levels and paces. The management concerns teachers cited pre-pandemic will be made more difficult due to the COVID-19 pandemic. As district leaders attempt to help their students "catch up," it is also likely that they may turn to more scripted curricula, which again threaten to stymie efforts for flexible pacing.

Finally, at the state and federal levels, our findings suggest that state departments of education should provide flexibility to districts and states attempting to implement CBE. This flexibility needs to go beyond seat-time waivers to consider accountability waivers, as well. Freedom from prescriptive accountability regimes will provide teachers and schools greater flexibility in educational time use and structures, which will, in turn, enable standards to be met at students' own pace. Additionally, districts need autonomy and perhaps even incentives to reconsider their existing structures (e.g., schedule, building organization).

Limitations and Future Research

There are some important limitations to this study. This study provides rich insight into the participating districts' approaches to implementing CBE and the challenges they faced in this process. However, the districts that were self-selected into Michigan's CBE pilot program differ from other districts in the state in meaningful ways that may impact generalizability. On average, the pilot districts serve populations of wealthier students, less diverse, and less likely to qualify for special education or English learner services compared to the state. In addition, teachers in these districts tend to be more experienced and have more advanced credentials than the state average. As such, our survey findings may not reflect the same experiences and challenges that other Michigan districts would encounter if they were to implement similar CBE programs. While the qualitative approaches are less concerned with

generalizability to different settings (e.g., Ravitch & Carl, 2019), it is still important to acknowledge that these districts are considered emerging implementors, and they may undoubtedly develop more sophisticated implementation strategies as their implementation efforts progress.

While the practices we ask about in our survey are essential for CBE classrooms, we are unable to assess whether teachers had utilized these prior to the adoption of CBE. If these practices were not reported, we could draw the conclusion that they are not working as intended; however, our findings would have been bolstered if we could have definitively concluded the extent to which these were new or established practices. CBE remains an emerging reform in Michigan, and as our case district suggests, schools have not committed to change at a systemic level. Additionally, the literature (e.g.., Evans & DeMitchell, 2018) highlights the persistent challenges of incorporating flexible pacing. Future studies should focus on identifying exemplar districts that have been successful in adopting flexible pacing and document these best practices. Our discussion focuses largely on district- and school-level barriers and neglects to investigate the extent to which state-level policies influence implementation. There is some existing evidence that states without specific policies have lagged in their implementation efforts. Future studies may focus on current and impending state-level legislation and its impact on policy implementation in Michigan.

CONCLUSION

As calls persist to "accelerate" student learning and address student learning needs in the wake of the COVID-19 pandemic, CBE will remain a potential solution; however, our findings highlight the extent to which CBE's effectiveness is tied to systemic-level change at the district and classroom level—change that takes a good deal of time and commitment that may not be in place in time to implement CBE with fidelity in the near-term. States and districts still interested in adopting CBE will need to commit to larger-scale reforms, including but not limited to adapting schedules, creating a culture of teacher collaboration, and addressing the competing demands of the curricula materials currently in use.

APPENDICES

Appendix 1. Teacher Interview Protocol

1. Tell me about how you got into teaching.
2. How long have you been at this school?
    a. Why {this district}? Why {this school}?
    b. Have you been at other schools?
    c. Did your previous schools focus on CBE?
3. Tell me about the evolution of CBE at your school.
    a. Probes: How did it begin? How has it evolved? Why was it implemented?
4. Tell me how you would define CBE?
5. How was it defined for you?
6. **Tell me how CBE is reflected in your practice / how do you practice CBE?**
    a. Probes:
        i. Formative assessment
        ii. Multiple forms of assessments.
        iii. Encouraging self-assessment
        iv. Remediation and reteaching
        v. Flexible pacing
        vi. Goal setting
    b. Opportunities for "choice and voice?"
        i. Activities
        ii. Assessment
        iii. Flexible pacing
7. **In what ways has your district implementing CBE impacted your practice?**
8. **Tell me about some of the challenges have you experienced while trying to implement CBE?**
    a. Probes:
        i. Culturally (students and parents' expectations);
        ii. Personally (your own views of teaching vs. the personal mastery way);
        iii. Resources
        iv. Structure
        v. Accountability
9. **What specific components of CBE have been most difficult?**
10. **What supports have been made available to you for implementing CBE in your classroom?**

   a. **Probes: Instructional coaching?**
   b. **Probes: Trainings?**
      i. **How effective have those trainings been?**
      ii. **How frequent have these been?**
      iii. **What has been the focus on these?**
      iv. **How helpful have they been?**

11. Tell me about the teacher community at {school}.
   a. Probes: How do they help you implement CBE?
   b. Probes: How do they shape your practices?
   c. Probes: Tell me about collaboration
   d. Probes:
      i. Time allotted
      ii. Effectiveness

Appendix 2. Code Book Excerpt		
Theme	**Code**	**Code Definition**
Challenges	Personal/self	Comments, examples where teachers described personal challenges (e.g., beliefs or attitudes) that limited their use of flexible pacing
	Department/ grade level	Comments, examples where grade-level or department policies limited teachers' ability to implement flexible pacing
	School-level	Comments, examples of school-wide policies/practices that limited teachers' abilities to implement flexible pacing
	District-level	Comments, examples of district-wide policies/practices that limited teachers' abilities to implement flexible pacing
	State-level	Comments, examples of statewide policies/practices that limited teachers' abilities to implement flexible pacing
	Resources	Comments, examples of resources (e.g., time, space, opportunity) needed to implement flexible pacing
Practices	Remediation during class	Comments, examples of students receiving support during instructional hours
	Remediation after class	Comments, examples of students receiving support after instructional hours
	Advancement during class	Comments, examples of instructional pacing within classrooms
	Advancement after class	Comments, examples of instructional pacing outside classroom hours
Facilitators	Personal/self	Comments, examples where teachers described personal attributes or beliefs (e.g., beliefs or attitudes) that facilitated their use of flexible pacing
	Department/ grade level	Comments, examples where grade-level or department policies promoting teachers' ability to implement flexible pacing
	School-level	Comments, examples of school-wide policies/practices that promote teachers' abilities to implement flexible pacing
	District-level	Comments, examples of district-wide policies/practices that promote teachers' abilities to implement flexible pacing
	State-level	Comments, examples of statewide policies/practices that promote teachers' abilities to implement flexible pacing
	Resources	Comments, examples of resources (e.g., time, space, opportunity) needed to implement flexible pacing

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