

3-1-2021

Competency-Based Education: Examining Educators' Experiences

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Recommended APA Citation

Bingham, A. J., Adams, M., & Stewart, R. L. (2021). Competency-Based Education: Examining Educators' Experiences. *The Qualitative Report*, 26(3), 674-695. <https://doi.org/10.46743/2160-3715/2021.4383>

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Abstract

Competency-based education (CBE) is an increasingly popular instructional model in K-12 schools. In this qualitative case study, we examine how teachers make sense of CBE, and what challenges they in implementing a CBE model. We find that CBE teachers' teaching identities had to undergo a shift to truly engage in CBE. Rather than acting as conveyors and assessors of knowledge, teachers had to construct their classrooms in a way that engaged and supported students in owning their own learning. We also found that educators face challenges around time, communication, and alignment.

Keywords

competency-based education, personalized learning, case study

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Competency-Based Education: Examining Educators' Experiences

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Competency-based education (CBE) is an increasingly popular instructional model in K-12 schools. In this qualitative case study, we examine how teachers make sense of CBE, and what challenges they in implementing a CBE model. We find that CBE teachers' teaching identities had to undergo a shift to truly engage in CBE. Rather than acting as conveyors and assessors of knowledge, teachers had to construct their classrooms in a way that engaged and supported students in owning their own learning. We also found that educators face challenges around time, communication, and alignment.

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Introduction

Currently, there is a press toward a more personalized learning experience for students in K-12 schools – particularly historically-disadvantaged students and students at risk of dropping out (see Bill & Melinda Gates Foundation, 2014; U.S. Department of Education, 2018a, 2018b). Practitioners and policymakers have answered this call for personalization with a variety of (often high-tech) instructional and school models including competency-based education (CBE) models. CBE, as a school model, is characterized by mastery-based progression; differentiated support based on students' personalized needs; assessment aligned to measurable, transferable learning objectives; and learning outcomes emphasizing knowledge creation and application, along with developing important skills and dispositions (Sturgis, 2017). For example, students in the same classroom may move through material at different paces, providing different kinds of evidence (e.g., quizzes, papers, presentations, dioramas, etc.) to demonstrate competency (or mastery) of skills and content. The key idea is that students must show competency to move on to the next level. The U.S. Department of Education (2018b) argues that personalizing learning through CBE and other similar models increases student engagement by making learning relevant, and that by combining multiple pathways to graduation, flexibility in how credits are earned, and variable pacing to account for student difference, these kinds of instructional models saves both time and money. Still, there is limited research on CBE as a school- or instructional-model at the K-12 level. CBE advocates argue that it has the potential to improve college and career readiness, increase student engagement, and foster equity. As such, it is crucial to understand the practice of CBE on the ground, in schools. Beyond that, it's important to gather information on how CBE is understood and enacted beyond the initial implementation stage, in order to examine successes and challenges faced by educators that cannot be explained by initial implementation “growing pains.” In this study, we examine educators' experiences as well as the challenges educators face as they engage in an established CBE model. Our research questions are as follows:

1. What is the experience of educators engaging in CBE in an established CBE model?

- a. How do educators make sense of CBE?
- b. What are the challenges and successes experienced by educators as they engage in CBE?

Toward answering these research questions, we employ qualitative case study, relying on interviews with teachers and administrators, observations of CBE classrooms, and document and website analysis to construct a beginning understanding of teachers' experiences in an established CBE model, including how teachers make sense of CBE, their practices, and the successes and challenges they face in doing so. In this article, we present early findings from this ongoing research.

Literature Review

Studies of competency-based education at the K-12 level are limited. Though CBE has been of interest at the postsecondary level for more than half a century (Nodine, 2016), particularly in professional programs, much of the work on CBE in K-12 contexts has involved policy statements or issue briefs (e.g., Twyman, 2014), or research conducted by advocacy groups like The Aurora Institute (formerly iNacol; e.g., Sturgis & Casey, 2018). In this section, we examine policy statements and issue briefs, as well as the limited existing research to discuss the characteristics of a CBE model, and the grading practices associated with CBE. We also explore the limited research on CBE implementation and outcomes. We conclude this section with a brief summary discussion of the gaps in the literature.

Characteristics of CBE

CBE advocates have argued that traditional modes of education have been too narrowly focused on academic skills such as content memorization and test taking and that traditional educational practices have emphasized uniformity of learning and yearly content coverage over pedagogy informed by learning science (Sturgis & Casey, 2018). They have further argued that traditional practices overvalue summative assessments and allow teachers' assessment of effort to unduly sway student grades, a practice that has been shown to disadvantage traditionally under-served students (Howley, Kusimo, & Parrott, 2000). CBE – sometimes referred to as mastery-based education or mastery-based learning (Sullivan & Downey, 2015) – has been proposed as a solution to these concerns, both by the U.S. Department of Education (2018a) and by advocates of innovative or technology-based educational reforms (e.g., Sturgis & Casey, 2018).

CBE has several distinct characteristics, including a focus on mastery of content, rather than time or effort; flexibility in how mastery is demonstrated, as well as pacing; and an emphasis on data-driven decision-making and instruction. According to the Aurora Institute, which is responsible for much of the existing work on CBE, CBE is a holistic approach focusing on academic outcomes as well as the development of academic skills and non-cognitive skills, such as motivation. (Sturgis & Casey, 2018). Other researchers have stated that CBE is designed to measure students' achievement levels solely through their demonstrations of clearly articulated mastery levels, not through effort or time spent covering course content (Sullivan & Downey, 2015; Twyman, 2014). Additionally, instead of emphasizing summative assessments administered at the same time for all students to document what they know, CBE utilizes flexibly timed assessments to account for differences in student progress toward learning targets. Completed assessments are analyzed by teachers in order to differentiate instruction to help students meet subsequent learning targets (Steele et al., 2018; Sturgis & Casey, 2018; Twyman, 2014). Through this kind of data-driven instruction,

CBE is intended to support teachers in offering clear feedback, and support students in gaining the agency to take responsibility for their learning (Sturgis & Casey, 2018).

In CBE, proficiency at the lower levels of Bloom's Taxonomy is seen as less important than the competencies in flexible thinking, problem solving, and applying knowledge to new contexts that will be needed in the world economy. Further, uniform progression is de-emphasized, in favor of a more personalized approach to instructional design. However, the concepts of *personalization* and *competency* are both open to interpretation (Steele et al., 2018) and have not been adequately defined in the literature. While it may seem like a semantic issue, ambiguity around what competency means could exacerbate achievement gaps if it is defined less rigorously for low-income students or students of color than it is for other students (Achieve, 2016). Through CBE's focus on personalized learning, all students are meant to have the clear guidance and support structures needed to meet their learning goals (Sturgis, 2015); however, it's important that *personalization* is used not to lower expectations for certain groups of students, but to adjust the pathways that each student takes to achieve competency. Despite the assertion that CBE improves educational equity, research on how proficiency is defined by teachers in a CBE model, and how students move through proficiency levels is lacking.

CBE Grading Practices

CBE is meant to support the concept that students' grades should only reflect what they know and are able to do, not their attitude, demeanor, or level of effort; however, reconceptualizing grading practices has been shown to be a challenge for teachers in CBE programs. Indeed, alternative grading methods – particularly those that do not include grading for effort or other non-cognitive skills – have long been difficult for teachers to get behind because grades are often seen by teachers as multidimensional constructs; while they measure academic knowledge, they also encompass teachers' ratings of non-cognitive student traits such as persistence, or authentic engagement with course material (Brookhart et al., 2016). This multi-dimensional approach to grading, however, can result in inequities for historically disadvantaged students (Campbell, 2012).

Although proponents of CBE assert that grades should only reflect cognitive performance (e.g., Brookhart, 2011), this component of the model has sometimes proven difficult for teachers to enact because they do not always agree that grading should not include non-cognitive factors. For example, in a two-year mixed methods study of CBE focused on implementation, student experiences, and student outcomes, researchers found that educators in CBE systems were upset that effort was not considered an appropriate grading criterion (Steele et al., 2018). Similarly, using a survey of 315 teachers, another study found that educators in standards-based grading systems used grades not to measure cognitive ability, but to teach social lessons about late work as preparation for the workplace (Tierney, Simon, & Charland, 2011). These practices, combined with the fact that teachers often use idiosyncratic weighting criteria when calculating grades (Brookhart et al., 2016; Tierney et al., 2011), could subvert the implementation of a CBE model.

CBE Implementation and Outcomes

On the whole, there is limited research on CBE in K-12 contexts. Existing research has indicated various challenges associated with implementation (e.g., Sullivan & Downey, 2015), and has shown mixed results for student outcomes in CBE models (e.g., Steele et al., 2018).

Implementation Challenges

Several studies of CBE have indicated that, like any educational reform, new CBE programs experience implementation challenges. Some research has suggested that CBE programs may be subject to inconsistent implementation – some components of CBE may be implemented, while others are negated – which could impact how CBE outcomes are interpreted. One recent study suggested that student curricular choice and personalized pacing, both key attributes of CBE systems, were not consistently implemented in schools piloting CBE (Steele et al., 2018). Though the educators in the study expressed commitment to a CBE model, ultimately, some key aspects of CBE in the classroom were not implemented. The participants also reported technological challenges and tensions in defining what proficiency meant, which may have influenced their implementation of student choice and flexible student pacing.

Other research has shown that challenges not associated with inconsistency also arise in new CBE programs. Sullivan and Downey (2015), for example, conducted an interview study of school personnel to examine reasons for moving to a CBE model, and challenges associated with implementation. They found that CBE increased teacher and student engagement and academic rigor. However, participants reported difficulties communicating with stakeholders and problems with alignment. They also reported difficulty finding the time to develop and implement CBE, which indicates a problem with capacity building – a common implementation issue.

Additional research on personalized learning, including some competency-based models, has shown similar challenges, including problems communicating the expectations of the model to stakeholders, technology alignment, and finding enough time to design and implement changes. For example, in a qualitative study of 30 elementary, middle, and high schools implementing personalized learning models, many of which were CBE models, Bingham, Pane, Steiner, & Hamilton (2018) found that schools had difficulties in reporting student progress to parents and with communicating their grading practices to outside stakeholders, including the state, and colleges and universities. Additionally, teachers in the study reported issues aligning the multiple technological resources that had to be used in order to support CBE. In a longitudinal qualitative study examining personalization practices in one high school (Bingham, 2017), teachers reported being overwhelmed, and not having enough time to plan. Ultimately, the school in that study created a new schedule to support teachers' needs.

These studies each indicate the importance of alignment in implementing CBE models. CBE programs have to align with state standards to ensure adequate performance on state assessments (Achieve, 2016; Bingham et al., 2018), while also developing a system to communicate with and align to higher education's more traditional systems of learning (Bingham et al., 2018; Sullivan & Downey, 2015). The research suggests that there has to be clear communication of learning expectations, CBE terminology, and competency levels not only among district administrators, school principals, classroom teachers, and their students (Egodawatte, 2014; Sturgis & Casey, 2018; Sullivan & Downey, 2015), but also with outside stakeholders, including district, state, and local college officials. Additionally, alignment between technological resources and alignment between teacher needs and school resources and scheduling may better support CBE.

Though several studies have explored CBE implementation, few studies have examined teacher and administrator perspectives, or specific classroom practices related to CBE, which is critical to fully understanding how this instructional model is interpreted and enacted across schools. Further, limited research examines what CBE looks like in established CBE schools. Rather, the research has focused primarily on initial implementation.

CBE Outcomes

There have only been a few studies of student outcomes in K-12 CBE models. In one study conducted over the course of two years, Steele et al. (2018) examined CBE in three large districts through a combination of surveys, site visits, and student achievement data. They found that competency-based models that emphasized student choice and project-based learning were more effective than models that emphasized flexible pacing or proficiency-based grading. However, the researchers stressed that the research design did not support causal conclusions. Another study focused on student outcomes in personalized learning schools, many of which utilized CBE, found that students in these schools showed significant growth in math and reading, when compared to students with similar academic performance from schools with similar demographics (Bill & Melinda Gates Foundation, 2016). More research on student outcomes in these models is needed.

Summary

The existing research indicates that CBE models are subject to the same kinds of implementation issues that affect many educational reforms, including inconsistent implementation, and issues with alignment, communication of expectations, and capacity-building. With regards to student outcomes, there is not yet enough research for educators to determine whether and how CBE is making a difference for students. In order to build a knowledge base on CBE toward understanding student learning experiences and outcomes in a CBE model, it is important to take a look at teachers' practices in established CBE schools. This may provide a better understanding of the successes and challenges of CBE beyond typical implementation issues, and may provide contextualized information for practitioners and policymakers, as well as context for future outcomes studies.

Theoretical Framework

We employ sensemaking theory to understand how CBE is perceived and enacted. According to sensemaking theorists, individuals actively, communally, and emotionally interpret the challenging initiatives and practices that they are meant to carry out in their organizations (Weick, 1995). While scholars have defined sensemaking in various ways (Maitlis & Christianson, 2014), commonly recognized properties undergird these different theoretical conceptions (Weick, 1995). First, sensemaking impacts identity (Weick, 1995). For example, sensemaking can occur when identity is threatened, such as when a policy or program induces within organizational members an existential dilemma whereby they question the essential roles and purposes in which they have invested their identities (Maitlis & Sonenshein, 2010). Sensemaking can also be viewed as a process of identity selection (Weick, 1995). Because each individual, represents a multiplicity of selves; an individual's sensemaking reaction to an event can be construed as a pragmatic process of selecting the identity felt to be appropriate to the exigency of the event itself (Weick, 1995).

It follows that organizations adopting innovative programs may face implementation challenges, as has been shown to be the case with CBE. Beyond the initial implementation stage, sensemaking theory supports the idea that individuals are consistently shaping and reshaping their organizational context through their ongoing sensemaking processes (Weick, 1995). For this reason, sensemaking theory is well-suited for our inquiry into how stakeholders perceive, interpret, and enact CBE practices in their educational settings.

Researcher Positionality

Though none of us have worked in a CBE school, all three of us are current or former K-12 teachers. Our experiences as teachers, particularly around reform and policy implementation deeply informed not only our choice of topic, but also the questions we asked and the perspectives we examined (educators). We are interested in issues of process and experience as they pertain to how teachers teach in a variety of contexts, and the challenges they face as they navigate instructional reform and new teaching practices and classroom models because we ourselves have experienced those kinds of transitions as well. Insofar as we could, we aimed to bracket our own experiences as teachers in order to focus on our participants' experiences. However, we also feel that our experience in K-12 education offered us additional insight into our participants' work and helped us to build rapport with them.

Methodology

We employed qualitative descriptive case study (Merriam, 1998; Merriam & Tisdell, 2015; Yin, 2013) to understand the practice of competency-based education, with a focus how teachers understood CBE, and on the successes and challenges they experienced. Descriptive case study aims to build a detailed account of a phenomenon (Merriam, 1998; Merriam & Tisdell, 2015) through the collection and analysis of an array of data, including interviews, observations, and documents. Case study supported us in investigating the particularity and complexity of a given case – in this case CBE – to better understand a phenomenon in context.

The approach to CBE may vary from case to case, and in this examination, the case under review holds a singular vision and mission at a district level, although teacher practice varies depending upon the model of the individual school. Due to the aligned vision and mission, the case under examination is bounded by a shared goal and is reviewed to identify stakeholders' experiences as they engage in CBE.

Data Collection

After receiving approval from our institutional IRB, we collected data from two school sites, an elementary school and a high school in a school district practicing CBE districtwide. The school district is situated in a suburban community in the Rocky Mountain region and began implementation of CBE more than a decade ago with a mission to “create opportunities for developing competent, agile learners who contribute to their community and achieve personal success” (District website). Data collection began in the fall of 2018 and included interviews and observations of multiple classrooms. We conducted formal interviews with two district principals, two teachers, and the district administrator who helped begin CBE in the school district. We also engaged in informal conversations with several teachers whose classrooms we observed, as well as a site administrator. Our interview protocol sought to understand participant experiences with CBE. We also designed our interview protocol using tenets of sensemaking theory focused on identity and the sensemaking process to gather introspective, first-hand perspectives and recollections of how they made sense of CBE and translated that into practice. All three researchers involved in this study conducted observations of classroom practice at the elementary site in three different classrooms.

School Sites

Two schools were selected as the principal sites for investigation, an elementary school and a high school. Our interviews spanned both the elementary and high school, however, we

only observed classrooms at the elementary school, due to testing schedules. Both research sites were involved in the initial inception of the district-wide initiative to adopt, implement, and refine CBE for all students.

Participants

As noted above, our participants included two teachers (Janelle and Carly), two principals (Casey and Brad) and one former district administrator (Ashlynn). Janelle and Carly are teachers at the elementary school. Carly is white and identifies as female, and Janelle is Latina and identifies as female. Janelle had six years of teaching experience, while Carly had been teaching for 20 years. Casey is their principal. He is white and identifies as male. Brad, who is also white and identifies as male, is the principal at the high school. Ashlynn, the former district administrator, is also white and identifies as female. We observed Carly's classroom and Janelle's classroom, along with two additional classrooms. Of the additional teachers we observed, one was new to CBE, while another had only been teaching for a few years. We have used pseudonyms for our participants to protect their identities.

Data Analysis

Our data analysis involved several cycles of analysis (Bingham & Witkowsky, 2021; Saldaña, 2013). We used coding as our primary form of analysis. More specifically, coding was a three-round process starting with an organizational coding method to identify broad areas of interest related to our research questions, such as "Assessment," "Learning Objectives," and "Personalization Practices" (Bingham & Witkowsky, 2021; Saldaña, 2013). The second round of coding involved inductive coding within these broad areas, to narrow the scope, synthesize, and locate emergent themes. In the final round of coding, we applied the theoretical framework, sorting our data into *a priori* categories developed from sensemaking theory, and using that to identify explanations for the patterns and emergent themes. These categories, created from the tenets of sensemaking theory, included "Interpretation process," "Identity formation," "Ambiguity," and "Retrospection."

Throughout our analysis, we drew on the constant comparative method to compare new data to existing data, identify if existing codes applied to the new data, and create and/or condense codes as needed (Charmaz, 2014). This process supported us in condensing codes into categories, and collapsing categories into themes (Charmaz, 2014). Analytic memoing occurred after the coding rounds to better make sense of the data and our analytic process. Thus, we memo-ed immediately after data collection and throughout each round of analysis (Strauss, 1987). From these memos, we constructed a case description. We also developed a memo recording possible responses to our research questions and used this memo to record key pieces of evidence and refine our findings.

Trustworthiness

We aimed to ensure our study's trustworthiness by engaging in triangulation, member-checking, and transparency in our research methods. Triangulating the data helped us to ensure that our investigation provided a credible account of CBE in these schools and classrooms. Member-checking ensured the transcripts from the interviews were validated by the participants to verify accuracy, confirmability, and transferability of the data.

Findings

In this section, we first present our case description in the form of a vignette. This vignette was developed from field notes and memos to showcase the overall structure of a CBE elementary school and describe classroom structure and typical teaching practices. In subsequent sections, we discuss the findings of our analysis, focusing on teachers' experiences and the challenges and successes they experienced.

Competency-Based Learning in Practice

In the elementary school we observed, CBE definitely looked a bit different from a more traditional school. The following vignette provides a description of the set-up and practices of a CBE elementary school in several classrooms.

As we walk into the elementary school, we are greeted by several teachers who direct us to the principal's office. The school is showing its age and when we meet the principal – Casey – he draws attention to it, saying “We’re building a new one that will be ready in Fall 2021.” He says that they do not have air conditioning and that it will probably be 95 degrees during testing tomorrow. He also notes that when it rains, they get leaks in the roof. Indeed, in the first classroom we observe, there are water stains on the ceiling. He says that even though the school is old, and they have these issues, their teachers stay, and they have increasing enrollment. He attributes this to the model, saying that the whole district has lost enrollment over the past two years, but his school is one of the only schools in the district that has increasing enrollment. He emphasizes that there is also a 90% retention rate for teachers and proceeds to talk about the general characteristics of the model at his school. He is visibly excited as he discusses how the model helps students who are behind but is also ideal for students who are ahead. After a few minutes, he walks us to our first observation – a “Level Five” classroom that contains students who are approximately in grades four through six.

The elementary school we are visiting serves primarily students of color (88%). The classroom we are visiting appears to be primarily Latinx students, with one black student and several white students. For the majority of the observation, there are 22 students.

In the classroom, objectives are listed on the board for each content area:

- Math: Identify lowest common denominator
- Literacy: Compare and contrast the theme between 2 stories
- Science: Describe the functions of the human body systems

Students meet by grade level at the beginning of the class session. So, this is a fifth-grade classroom at first – all the students who would be considered fifth graders in a more traditional school gathered in the classroom as the bell rang. They then proceed through a warm-up exercise. The teacher, Janelle, explains that after the warm-up the students switch classrooms. Once the warm-up is over, she has a group of level six students, a group of level five, a group of level four, and one level three student. In other classrooms, there is a class of all level

fives and all level fours. Janelle says she has mostly fifth graders, though there are some fourth graders and a third grader in the class. There are a couple of level seven's floating around that she calls "masters," who float around and help other students. Essentially, it comes down to ability-grouping as the way to personalize instruction and objectives. We ask Janelle about it, and she explains that there is homogenous grouping in literacy in the morning and heterogenous in science and in the afternoon. She mentions that the groups fluctuate each day depending on the students' data, so students may have different classrooms each day.

While the students work, Janelle walks us through Empower – the school's learning management system. She has "Playlists" that are loaded for levels four, five, and six for the entire year. Teachers, students, and parents can see every assignment, whether the students are at one (below), two (good enough), or three (mastery). As she explains, the depth of knowledge (DOK) is what is required to move on – sometimes it is a one, sometimes it is a two, sometimes it is a three.

When she is done the students switch to science – the "Get into your science playlist." These playlists are scaffolded by "DOK" and in this class, run from levels four to six. Janelle explains that she plans out the whole year for all three levels. She says that now that she has all of the playlists, she just adjusts them for her kids each year, and for their levels. The amount of work this entails for a new teacher to develop must be overwhelming, but Janelle says it is easier once the playlists are initially created.

Our next observation is termed "Level one and Kindergarten," which Casey describes as being made up of students who are approximately first graders. This class is focused on setting goals and data. The teacher asks, "Where do you want to be by the end of the year? Today we're going to be talking about your goals. We have a lot to learn, that's why it's so important for us to set our goals." She then projects a sheet with "My reading goals" on it. The students then pair up and talk about what they want to learn about on the internet and fill in their reading goals. The teacher reads the goals aloud and the students say, "Level 2." The teacher has an achievement board with students' names written on cards and aligned to a particular level. The students use where they are at to set their next goals.

There are "success criteria" on the wall that indicate scores one through four:

- Score 4: "I can do it just like the teacher."
- Score 3: "I can do it right with no help most of the time."
- Score 2: "I need some help."
- Score 1: "I can't do it by myself – yet."

Level 1 Dibels scores are on the wall as well – the students are asked to set some goals related to the scores and told to choose something bigger if they have already met the goals. All over the classroom there are students' names aligned with specific levels and goals. The teacher reads the scores and names aloud again.

What is striking in each class is the transparency with student data. It's talked about aloud, it is displayed on the TV and on the wall, and students seem to know where they are and where others are. The teachers read many of the higher-level students' scores aloud. We can see what the principal means when he says the students take ownership of their data: As we leave, the students being to work on a writing prompt: "Here are the things I will do every day to reach my goals."

This vignette was developed from our field notes and demonstrates how teachers at two different "grade levels" enacted CBE. The vignette offers some examples of CBE in practice, including the use of "levels" instead of grades, the use of technology and ability grouping to personalize instruction and objectives, and how students were supported in taking ownership of their learning goals. These key practices formed the foundation for how teachers made sense of and enacted CBE in their classrooms. In the following sections, we draw on our observations, as well as our interviews with key stakeholders to address our research questions, identifying themes within each.

Making Sense of CBE

Throughout the course of our analysis, we found that teachers' teaching identities had to undergo a shift to truly engage in CBE. Rather than acting as conveyors and assessors of knowledge, teachers had to construct their classrooms in a way that engaged and supported students in owning their own learning. Teachers understood CBE as requiring four specific attributes that they had to fold into their teaching practices and identities in order to be successful: (1) A focus on and intimate knowledge of learning standards in order to monitor student progression and help students set learning goals for themselves; (2) An emphasis on teaching strategies and resources that engage and empower students to be in charge of their own learning; and (3) A clear plan for students to become cooperative learners.

Intimate Knowledge of Standards

According to Carly, a teacher at the elementary school, teachers need "an extremely good understanding of all the learning targets and all of the standards" that students need to master. Such knowledge is not an end in itself but a means by which teachers can help their students move efficiently through their learning standards. Consequently, she also argued that teachers must have "a really good understanding of the learning targets that are coming up" so that they know the learning levels at which their students are aiming. Janelle, another elementary teacher, echoed this observation as well, stating, "You still want them to have access to a level that's a little bit higher than what they're doing... They might not master the level above, but they still need to see some of it." This knowledge of standards also allows teachers to be more effective at setting goals with their students. As Casey, the elementary principal, asserted, "We don't do homework; we do 'goal work,' during what he referred to as "goal conferences." It is students, not teachers, who set the goals and keep them in a dedicated portfolio for future reference. As another teacher said, "They [students] know where they are, and they know what they're working on." Janelle reiterated this point, explaining, "we really work hard to help kiddos learn their own genius and hear it often enough from us that they really believe it for themselves." As Casey puts it, the mission is to help "kiddos become the best version of themselves." This mission statement points to the second major theme we

identified in the course of our analysis: for CBE to work as intended, it must be the students, not the teachers, who take charge of learning in the classroom.

Engaging and Empowering Students to Own their Learning

As Casey, the elementary school principal, explained, moving from the question, “How do I manage the classroom?” to “How do I engage all students?” is central to the philosophy of CBE. A key way CBE educators create and maintain this engagement is by understanding that while students may take different amounts of time to master a learning target, learning is, as Carly put it, “constant” in that all students should be “taught where they’re at” and therefore always engaged in learning. Another teacher mentioned that “no student should be stagnated.” This sentiment was echoed by Ashlynn, the former district administrator, as well as by Brad, the principal at the high school. Brad specifically mentioned that CBE helped keep students moving, no matter the level at which they were working. Casey echoed these observations that there must be a continual pressure to learn, stating that CBE “means that we are meeting the needs of the students exactly where they are and moving them forward as fast as they are able.” Yet such pressure is not commendable simply because it keeps students busy. The point of constant learning is, according to Ashlynn, “not ritual engagement, but authentic” engagement, the latter of which she says can be seen when “kids are excited to talk to you about what they’re learning and what things they need to work on” to reach the next standard or learning target. This observation seems to corroborate elementary teacher Janelle’s observation that when students are engaged, problematic classroom management issues go away.

As demonstrated in the vignette, transparency around data, student goals, and student progress is a key characteristic of a CBE model. Teachers interpreted this as supporting student ownership and agency in their own learning. “Student agency,” noted district administrator Ashlynn, “is a promise we make to every kid when they walk in the door of our school system.” Therefore, the central question to be asked in a CBE system is, according to Ashlynn, “How do we empower learners to understand who they are—self-awareness—and how to manage that learning that they want to take on?”

When students have achieved this agency and self-awareness, it can be seen in how they manage their own learning. As an example of this, Ashlynn discussed a hypothetical student who wanted to “double dip” by using one assignment to meet two different standards in two separate classes. Ashlynn imagined the student saying, “I’m going to work on this writing standard in my science class, this nonfiction writing standard,” then asking her, “Hey, can I turn this in to my English teacher?” Ashlynn explained that students like this may “think they’re getting away with something,” but that instead of feeling manipulated, teachers should see such thinking as “beautiful” because it demonstrates students’ “true understanding of expectations of skills.” Also, when adults allow students to take this initiative in their own learning, there is the added benefit that “kids feel like they’re generally respected and a part of the learning.” Such a feeling naturally leads, as Ashlynn points out, to students being the best advocates for their own learning.

In order to be such advocates, students must also know their own data in order to make what Casey, the elementary level administrator, called “empowerment decisions” for their own learning. Echoing this, Brad, the high school administrator, underscored the importance of students taking “ownership of their own data.” For him, this took the form of students knowing “where their levels are . . . and what they’re learning,” as well as taking ownership of their learning by “setting goals off of benchmark testing.” At the elementary school, even kindergarten students exhibited this ownership. In our observations, we saw that the kindergarten teacher required each of her students to develop four goals relative to DIBELS

(Dynamic Indicators of Basic Early Literacy Skills) testing, and to share these goals with fellow students as well as with the class as a whole. Such sharing presumably helped students to internalize, and therefore take ownership of, their articulated goals. According to Carly, this ownership of learning not only creates empowered learners, but excited learners as well. “Assessments aren’t scary,” Carly noted. “When I tell kids, come and take a test with me, they get a really big smile on their face and they’re really excited because they know what they’re going to be able to show.” Owning their learning, of which knowing their own data is a part, is an essential ingredient to creating engaged learners in CBE systems.

Planning for Cooperative Learning

According to our participants, students in CBE classrooms are meant to help each other progress through their learning standards. Consequently, a central question for CBE is, as Brad, the high school administrator, put it, “How do you create a team atmosphere, a team dynamic, so that they [students] are supportive of each other and they’re encouraging each other and they’re learning together?” Janelle, an elementary school teacher, seemed to offer an answer in her belief that “kids that are at different levels can help in different ways.” In this “cooperative learning system” of CBE, Janelle asserted that

Everybody’s a leader in something, so one of my students might lead another student in learning addition facts, where another student might be able to help another student learn their sight words or, you know, reading more fluently and less like a robot, whatever it is. Like every student can be a learner and every student can be a leader.

For Janelle, the practice of cooperative learning was the only way for her to make sense of CBE. The teachers alone could not handle the degree of differentiation required in CBE, even with the use of the technology-based “playlists” described in the earlier vignette. In Janelle’s classroom, and in other classrooms at the elementary school, we saw classes structured around students helping students – specifically, those students who were working at higher levels were often asked to teach or tutor other students who were struggling.

According to Ashlynn, the former district administrator, when students engage in this cooperative learning, it is a sign that a teacher is successfully implementing CBE. She explained, “When kids are taking charge and making choices and making decisions and can give back to the learning system and building learning opportunities for other kids, that’s when you know you’re at rock star level, right?” Yet it is also a sign that students are growing together as a healthy team where, as Janelle says, “They celebrate their own successes. They celebrate each other’s successes . . . they just love it.” The principals, Brad and Casey, explained that once teachers work in a CBE system, most never want to return to traditional systems of education.

Challenges and Successes Experienced by Teachers in a CBE Model

As the teachers in this case made sense of the CBE model in their classrooms, they experienced a variety of successes and challenges. The primary challenges identified by our participants centered on issues of time, student progress, communication, and state-level requirements. The successes were rooted in one singular theme regarding the primary philosophy of CBE: meeting students where they are in their academic advancement.

Time Limitations

Time limitations commonly appear throughout education, especially for teachers, as they study standards, prepare lessons, deliver instruction, evaluate student work, and analyze data. Although planning periods and teacher workdays are scheduled throughout the school year, time continues to be an issue for teachers. In a CBE model, time limitations heighten as the extensiveness of student data-driven instruction and personalization require teachers to constantly know where their students are performing. At any given time, a student may advance a level, and CBE teachers must identify this advancement and restructure the learning for the student guaranteeing learning continues to progress. As such, teachers were consistently making sense of and restructuring CBE through the lens of time limitations. Janelle, one of the elementary school teachers, responded to this challenge by creating the entire year's "playlists" prior to the start of the school year, thus restructuring how her time was utilized during the year. She was able to focus on data analysis and adjustment, rather than initial planning. Still, according to her, "You have to continually look at data, continually look at growth, every two to three weeks. It takes a lot of time, energy, and exhaustion." Carly, another elementary teacher, revised student objectives on a weekly basis, but also said that this took a considerable amount of after-school time. From the elementary principal perspective, Casey explains, "there's always a need for time", as he tries to, "do what [he] can, to honor [teachers'] time", but this often proves not enough. Considering the time challenges already existing in a traditional school model, CBE's data driven model and near-constant assessment of each student's level and progression exacerbates a preexisting issue.

Ensuring Progress for Students Who Fall Behind. Time issues also emerged in relation to student progression. Students enter schools at various stages of development, with varied skillsets and external factors impacting their learning, behaviors, and development. CBE requires that students are able to progress at their own paces but catching-up a student with learning gaps can be challenging for a variety of reasons. This is further explained by Casey, the elementary school administrator, who remarks:

It has the same challenges as traditional learning where it is tempting to socially promote someone, especially if they have an IEP, especially if they are culturally and linguistically diverse, especially if they have trauma in their background. There is just so much you have to consider, and you have to really want to put people first and really think about the mental well-being, the relationship that the child has with their own learning, and just be super careful about it.

Though external issues may arise, CBE utilizes vertical alignment to support addressing students' learning gaps. Carly, an elementary school teacher, explained this further:

One thing that we've done in our district is we've aligned the learning targets, so you can say, okay, if this is what you're learning at third grade, this is the next little piece you would need to know to master the fourth grade learning target, and we can start bridging some of those gaps and closing the gaps, so we can catch kids up and get them to possibly learn more than a year's worth of content in a year by doing that bridging.

Yet, challenges arise in aligning this practice with the district goal of having students show 1.5 years of growth in a single calendar school year. Casey explained that this created difficulties:

If you just think about that analytically, you have a fourth grader who is learning at the second grade level, so they've already been in school for five years now or they're in their fifth year of school and they're two years behind, so they haven't done a solid year's worth in any one academic year, and so how do you then plan to get them a year and a half worth in one year, when they're currently on a trajectory where they're not getting one year in one year? And so, those are all the things that you just really have to be careful about and really thoughtful about and how you approach it.

Participants explained that CBE could support multiple student growth timelines, but that those timelines did not always align with district goals. A key challenge for teachers then, was figuring out how to help some students accelerate their learning, while helping others maintain progress and catching up those who had fallen behind.

Communication of CBE to Other Stakeholders

Communication in education involves various stakeholders, including federal and state agencies, school districts, school buildings, community, and parents. This diverse collection of stakeholders operates from the top-down, which requires a level of clarity and context to communicate results to an array of audiences. In CBE, communicating with parents can be a challenge, as CBE's innovative approach to education goes against traditional understandings of learning. Teachers and administrators reported that they had to educate parents on the complexities of the CBE model; a simple report card or pamphlet would not suffice. Moreover, parents had to be asked to disregard their existing knowledge of school operations and traditional functions, in order to understand their child's educational experience in a CBE classroom. Brad, the high school administrator, explains the challenges in communicating a level system as a replacement of the traditional grade scale:

They [the parents] all grew up in a model of social promotion, you know, an A, B, C, D, F, it does not matter, I mean, no matter what, you're moving onto the next level, so sometimes a parent goes, I don't get what 80 percent of level two means, just tell me if they had an A or a B, so I think that's a tough one.

This was particularly a problem at the high school level, as that is when it is most common to see letter grades. However, at both the elementary and high school levels, teachers experienced issues with communicating the shift from "grade levels" to "competency levels". Janelle, an elementary teacher, explained that to educate the parent, the paradigm shift from levels to grades is a matter of breaking down the difference:

If you do not send your kid to school for forty days, and your student doesn't pass level zero, yeah, they're going to first grade next year, but they're still on level zero. They have to be here. They have to be learning this stuff. They have to have access to it and opportunities to get it, and it's very hard for parents to understand. What do you mean they are still going to be in level zero? What are you trying to say? And, some of the parents are shocked, like, why is my student in a first-grade classroom? There is no first-grade classroom. Your student is in a level one classroom. Well, why? Because, they're not ready for level two. But, they're in second grade. Yes, they are in second grade, but they are at a level one classroom, because that's where they're at.

Often, explaining the nuances of a CBE system to parents requires a logical explanation of the parallels between CBE and a traditional model. As Brad, the high school principal, explains, he sees educating parents on CBE as:

Retraining parents, because we've all gone to schools different. I don't know what a doctor does, all day long. I don't know what a lawyer does, but everyone seems to think they know what a school is like, because they've been through it. Everyone's been through half their life in a school, so it is hard retraining some of the parents.

Communicating student outcomes in the CBE model continued to challenge administrators and teachers, even as the model had been in place for more than a decade.

Communicating CBE processes to outside stakeholders also proved to be a challenge for CBE teachers and administrators. State level standardized testing and reporting of school data continues to influence daily operations of school buildings across the nation, and the policies and regulations for reporting required data uniformly assumes schools operate under traditional school models; thus, the reporting of information, including student population numbers and grade level data, requires certain pieces of information, such as grade level and performance on grade level standards, in order to align with traditional models. The CBE model provides personalized instruction and learning progressions not aligned to traditional models, so communicating information and aligning reports to state policies and regulations was challenging. From the administrator perspective, Casey explains this challenge through an analogy, in which he says:

It feels a lot like, you know, in a gender you have to say if you are male or female. Well, not, in the state of Colorado, they're going to have a gender-neutral category, which is great. That's kind of what CBE is. We have this level ambiguity, but you still have to check the box at times to say what grade someone is in.

Ashlynn, the former district administrator expands on the issue with state-alignment, saying:

One thing that's been a real challenge at the district level is our district has really been fighting with the state, because we have students that are working at a level two, and yet, they're forced by the state to take the level three benchmark assessment at the end of the year or state test, and it's really just setting that student up for failure. If a student is really struggling, and you know they are at a level two, having to give that level three assessment has been a real challenge, and it's really disheartening for the kids because they see how much growth they're making, and they've worked so hard on their goals, and they've made their plans, and they've worked on their plans, and they made their goals, and then to see that test and just to realize, they don't even need to see the scores. The kids understand, like, they're looking at this test, and it's really out of their league, and they know it, and we give them lots of strategies and we give them skills and test taking skills, and you know, we tell them this is just one test and it doesn't define you, you know, all the things that a good teacher would do, but it still is really hard on their person when that happens to them. And, that's been one of the harder things for me to see is just to see these kids who work so hard and to be so proud and have so many successes and celebrated throughout the year for all of their growth, and then to watch them just feel so terrible when

they're given this assessment that just doesn't make sense with where they're at.

The issues with state alignment emerged from a model of uniformity CBE rejects and contrasts through the personalization and meeting students where they are. Teachers understood these communication issues as being problematic for CBE, but they reported issues primarily in communicating with parents. The administrators, however, expressed a lot of frustration in dealing with state and federal processes that did not align with the tenets of CBE.

Successes

Meeting students where they are is a key goal and a characteristic of CBE models. To capture the essence of how teachers understand CBE as supporting personalization and meeting students' needs, consider Rebecca's story.

Rebecca entered a competency-based education model beginning in kindergarten. She spends her day setting goals, learning common language used across the school, and engaging in learning personalized to her level of development. By the end of her kindergarten year, Rebecca is advanced from level zero to level two. The following year, she moves from level two to three, and by fifth grade, Rebecca's math and reading performance equates to that of a seventh grader.

Rebecca's parents receive a request to meet with the school principal. Puzzled by the need for a parent meeting, they enter a conversation regarding Rebecca's exceptional advancement through the levels and need for higher level instruction. The principal opens a dialogue about the possibility of Rebecca moving to the middle school as her progress warrants this move. Though she is at a traditional fifth grade age, it is the intention of CBE to meet students where they are, which, in this case, means Rebecca could benefit by continuing her accelerated learning at the middle school level.

After strong consideration of Rebecca's needs, not only in academics, but also socially, emotionally, and developmentally, the decision to move her to the middle school is finalized. Before the decision, lengthy discussions and collaboration between the parents and school staff occur to consider the holistic picture. Rather than send Rebecca to a 6-8 grade level middle school, the decision is made to send her to a K-8 school arises, so that Rebecca remains in an environment in which she is able to socialize with other children her age.

This story was developed from our conversations with CBE teachers about their students' experiences and demonstrates how the parents, teachers, and administrators together made decisions to support students' needs. The decision to move a child for the sake of meeting them where they are was a difficult one. Parents, teachers, and administrators weighed various factors to assess what course of action had the greatest possibility of providing the student with access to appropriate instruction and learning. As Janelle understood it, the ability to make these kinds of individualized decisions was the greatest strength of CBE. She explained:

It's basically to meet students where they are, academically and as a learner. You're basically getting to know your students, getting to know your child, and

meet them where they need the most help, and you're not going to be cycling their growth. You're going to be enhancing their growth. And, if they're ready, for example, I have a kiddo that was at a level five equivalent to a grade five literacy level, and the student literally only had a couple more targets to hit. Now, she is working at a grade six literacy level, right now, because she is ready from August to October, and she's been working at a level six since the end of October. [It's about] meeting your students where they are. I'm not going to keep the student where they are all year long, because that's not what she needs.

Though some students struggle to advance, those ready to advance are able to advance, eliminating stagnation and disengagement from learning. Carly, an elementary school teacher, reinforced this sentiment, adding:

One thing that I think is important about our design is sometimes you might have a student that is solid at math, and in the traditional system, that student would be in third grade and maybe they struggle at reading, but that student would be in third grade. Well, in our system, if that student is solid in math, that student will be working at a fourth-grade math level, and if that student struggles in reading, they might be working at a second-grade literacy level, but their needs are being met right where they're at, no matter what the content is.

As our participants noted, this is one of the most exciting aspects of a CBE model – students don't have to move at the same pace through all of their subjects. There is room for remediation and acceleration for all students in all content areas.

How teachers made sense of school goals to meet students at their levels stemmed from personal experiences with not receiving personalized attention in school. For example, Carly mentions:

I became a teacher, because I was a gifted student, and I was often just sent to do the next worksheet, and school was really boring and not that valuable for me, and I also had a lot of friends, and even a cousin, who was ultra-minimalized, sent to the back of the class, pretty much ignored, because he had struggles with learning, and I thought both of those extremes are really unacceptable.

Janelle affirmed this, explaining:

Kids that are at different levels can help in different ways, instead of utilizing a kiddo that's not quite where the rest of the class is at, waiting on everyone else, they're still engaged into the learning, at all times.

Overall, participants identified that the successes of CBE lie in teachers' capacity to reimagine their teaching and consistently engage students in their learning and personalize students' experiences.

Discussion and Implications

Our findings corroborate some existing research literature related to CBE and to other personalized learning models. For example, teachers in CBE models have been shown to need extensive time to implement CBE systems (Sullivan & Downey, 2015). Similarly, educators in

personalized learning models drawing on CBE have experienced challenges in designing and implementing personalization practices due to time limitations (Bingham et al., 2018). In this study, we saw that finding the time to engage in all the aspects of CBE was a real challenge for teachers. Our participants discussed the time needed for CBE teachers to engage in instructional design and planning, as well as data analysis and instructional adjustment. As Carly stated, teachers can only hope to get “better and better” over several years of practice, a testament to the time required to deliver CBE. Other studies of personalized learning models have found similar issues with finding time to develop individualized lessons, perform adequate data analysis, and respond to student needs (Bingham, 2016; Bingham et al., 2018).

For CBE to be successful, we recommend that time be built into the school schedule to accommodate the extensive time needed for teachers to plan, and to engage in the data analysis required for CBE. Time should also be built into the schedule to allow for catching up students who need additional time or support to show competency. Further, as we’ve noted above, data transparency toward encouraging student ownership of their own learning, appears to be a key characteristic of CBE models. However, a concern that could arise is the impact of this kind of transparency on students’ social-emotional wellbeing. Thus, we argue that it is important that teachers are trained on how to encourage data transparency and ownership, while still being mindful of how shared data can impact a given student’s social-emotional state.

In this study, communicating the specialized characteristics of a CBE model to parents and aligning those characteristics with state-level assessment needs were significant challenges, which has been seen in other studies. Existing research has shown that schools engaging in practices that differ from traditional modes of education, particularly related to grading, have faced challenges communicating their practices to parents and other outside stakeholders. For example, Bingham et al. (2018) found that personalized learning models, including those engaging in CBE, have difficulty aligning their students’ needs with the needs of state assessments, colleges and universities, and state and federal policies. Further, in this study, participants discussed challenges in communicating the nuances of CBE’s grading practices, which has been shown to be a consistent issue for schools using alternative grading strategies (Guskey, 2004; Peters & Buckmiller, 2015).

We have made this recommendation in other articles on personalization (Bingham, 2016; Bingham et al., 2018, but as schools move toward more personalized instructional models, it will be critical for district and state policies to accommodate these kinds of specialized models. It is difficult to sustain innovative practices at the school-level, if those practices are not supported at the district or state levels. If students are required to be tested by grade level, this can create issues for CBE schools and for state-level data. For example, the data collected by the state in the assessments would not accurately represent students’ learning because the assessments are misaligned with students’ levels. This kind of misalignment must be considered at all levels.

Our study investigated a school that had implemented CBE more than a decade ago. Yet, this school and its teachers, whether experienced with CBE or relatively new to the practice, still experienced some of the same challenges identified in research on CBE implementation. This suggests that sustaining a CBE model takes continuous work at both the individual and organizational levels, to support new teachers in engaging CBE practices, help new students understand and be successful in the model, and communicate CBE to parents. Our work also suggests that changes to state and federal systems of assessment would better support CBE.

Sensemaking

Applying sensemaking theory to our findings, we found that teachers' teaching identities had to undergo a shift to truly engage in CBE. For example, Ashlynn (the district administrator) discussed how teachers new to CBE often have to go through a period of mourning for their old ways of teaching. Consequently, becoming a CBE educator often requires a fundamental transformation of teaching identity, one which places students at the center of learning. If a teacher is able to make this transformation, they will, as sensemaking theory suggests, have pragmatically selected the identity that best meets the requirements of a new context (Weick, 1995), which, in this case, is CBE. However, as Casey suggested, not every teacher is able to select the self that is required to flourish in CBE and may ultimately have to move to a school using a more traditional system of education.

In thinking about teachers' sensemaking processes and identity construction, we argue that teachers may need support in making changes that require them to reconstruct their teaching identity. In an established CBE model, such as the ones we have discussed in this article, support could come in the form of communities of practice through a process of legitimate peripheral participation (Lave & Wenger, 1991). Legitimate peripheral participation (LPP) describes the process whereby newcomers to a community become experienced participants. LPP conceives of learning as a situated, and social phenomenon, wherein participation in community practices can support the reconstruction of teaching identity and practice. By organizing a community of practice around a specific area of knowledge or activity (in this case, CBE), teachers can be supported as they are integrated into the community. LPP in a community of practice could offer an opportunity for teachers to reconstruct their teaching identity and practices through a predetermined collaboration between more experienced CBE mentor teachers, and teachers who are inexperienced with CBE.

Future Research

Given that even teachers in established CBE systems experience challenges finding the time to develop CBE, future research should address the possibility of teacher burnout in CBE schools. Burnout can lead to teacher turnover, and high rates of turnover may make it difficult for a school to train and integrate teachers into an innovative model like CBE. Future research should focus on students as well. Few studies have examined student perspectives in these kinds of models (Ryan & Cox, 2017 is a notable exception), but no studies to date have gathered in-depth qualitative data on students' experiences. This could help build an understanding of how student interpret their experiences in a CBE model, how they feel about the level of data transparency required in CBE, and how CBE impacts them over time. Policymakers, teachers, and administrators may argue the benefits of CBE, but if students' experiences are not what they are meant to be, then CBE may not be as beneficial as its proponents indicate. Finally, no study to date has examined the long-term outcomes of CBE models. As this model becomes more popular and has been in place for longer periods of time, it will be critical to understand how CBE affects student outcomes and experiences, both in the short-term (formative and summative assessments), and in the long-term.

Conclusion

In this study, we sought to examine CBE practices, how teachers make sense of CBE, and what successes and challenges emerge in implementing a CBE model. We found that teachers consider developing student ownership for their own learning and creating the conditions for student cooperative learning as being critical to understanding CBE and enacting

it in the classroom. We also found that teachers encountered challenges around time, communication, and alignment, but felt that they were successful in meeting students on their level. Ultimately, engaging in CBE required educators to reconstruct their teaching identities.

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Article Citation

Bingham, A. J., Adams, M., & Stewart, R. L. (2021). Competency-based education: Examining educators' experiences. *The Qualitative Report*, 26(3), 674-695.
<https://doi.org/10.46743/2160-3715/2021.4383>
