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Implementation of Skill-Based, Transdisciplinary Competencies and Their Influence on Teacher Practice

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Implementation of Skill-Based, Transdisciplinary Competencies and Their Influence on Teacher Practice

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by

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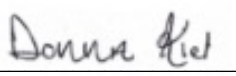

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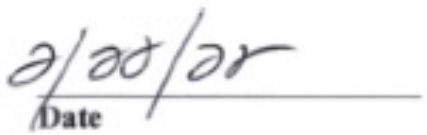

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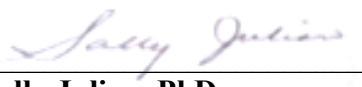

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Certification of Authorship

I certify that I am the sole author of this dissertation. Any assistance received in the preparation of the dissertation has been acknowledged and disclosed within it. Any sources utilized, including the use of data, ideas, and words, those quoted directly or paraphrased, have been cited. I certify that I have prepared this dissertation according to program guidelines, as directed

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ABSTRACT

Competency-based education has been a growing movement in K-12 education but faces several implementation challenges. In addition, discussion in the field is lacking related to the competency-based principle: learning outcomes emphasize the authentic application of knowledge. New to the competency-based field are proficiencies called *competencies*, which are skill-based, transdisciplinary proficiencies that are structured across a continuum of varying performance levels. This study employed a case study methodology utilizing teacher and educational leader interviews as well as artifacts to explore the implementation of competencies in a competency-based organization and two schools that partnered with it. This study specifically investigated how competencies are implemented at these schools, how competencies influence teacher practice, and implementation challenges. Major themes in the findings include a comprehensive description of: (1) competencies and their deliberate connection to authentic, agentic learning experiences, (2) a dynamic of push and pull between competencies, content, and project-based learning, (3) notable mindsets amongst teachers, (4) characteristics of classroom preparation and practices, (5) professional development, and (6) challenges. This study concludes with implications that address: (1) increasing teacher capacity for competency-based education, (2) developing structures to support authenticity and agency, (3) using competencies as proficiencies and as a tool for teaching, (4) the intersection to other educational fields including social & emotional learning, project-based learning, and service learning, (5) potential solutions to identified challenges, and (6) system-wide structures that may better support competency-based education at scale.

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Acknowledgements

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Chapter 1: Introduction

Background and Educational Aims

Much of the current education system in the United States can trace its roots back to the Industrial Revolution where schools were designed from the Taylorist factory model that prioritized efficiency. Similar to the division of labor and time schedule signaled by a bell in the factory model, students were organized based on age and discipline and moved from class to class by a bell schedule. In addition, credit was based on seat-time, a standardized curriculum was set nationwide, and performance was largely judged by the ability to recall content. (Tyack & Tobin, 1994) The factory model of education was successful in that it aided the development of a workforce that would propel the United States to economic prowess (Philhower, 2017). Today, about 150 years later, society has changed remarkably since the industrial era, but the core structure of the American education system, despite many reform efforts, has maintained its industrial design (Tyack & Tobin, 1994; Wagner & Dintersmith, 2015).

Competency-based education has been a growing movement in public education over the past decade that seeks to transform the industrial model of education. The movement can be considered to be *in its infancy* in terms of its familiarity, or lack-thereof, within the general education community and the relatively number of schools that employ the model. Yet, the current competency-based education movement can also be regarded to have considerable momentum as many states, motivated to appropriately prepare young people for the needs of the modern economy, have employed some degree of competency-based policies.

Competency-based education is a model of education built on a strikingly simple concept – learners should advance by meeting proficiency in knowledge and skills rather than through seat time traditionally designated by the Carnegie unit. Yet the principles and motivations that

follow this simple idea are nothing short of transformational in their aim to uproot traditional industrial school structures and to change the paradigm of teaching and learning. In addition to (1) students advancing upon mastery, an additional four core principles of competency-based education include (2) proficiency-based objectives that are explicit, measurable, and transferable, (3) assessment that is a meaningful and positive learning experience to both (a) propel understanding and (b) empower students, (4) rapid, differentiated support is provided to students who do not meet proficiency, and (5) learning outcomes emphasize the application and creation of authentic knowledge. (*Iowa Department of Education Guidelines*, 2016; Sturgis, Patrick, Pittenger, 2011).

The motivations behind competency-based education pertain to educational aims that are philosophical, equity-based, and economic, and will be elaborated upon in the subsequent sections. Education philosopher Nel Noddings (2013) contends that the *why* and the greater aims of education are too often absent in conversations around education, and insists continuous discussion of aims is essential to both democracy and education. With this in mind, the reader is encouraged to deliberately and closely contemplate the aims discussed below and critically consider them throughout the remainder of the paper. Lastly, in addition to overarching aims, competency-based education is also promoted because it is argued to better support the learning sciences.

Philosophical Aims

Over the past decades public K-12 education has been influenced by neoliberal paradigms that have manifested through standardized testing, competition, privatization, and overemphasis of education as a commoditized private good (Lipman, 2011; D. Ravitch, 2020). Within this paradigm, test scores and economic competitiveness can seem to be the only valid

reason for educational reform and change (Savage, 2017). Thus, it is crucial to address broader philosophical aims of education such as cultivating the whole individual and fostering a democratic, sustainable society as valid reasons for reform within themselves.

Articulated by John Dewey over a century ago, and maintained by large numbers of thinkers in education today, education serves an important purpose of developing the whole person and developing characteristics in learners that lead to pro-social and democratic actions by society (Dewey, 1916; Noddings, 2013). Building on this philosophy, Nel Noddings (2013) argues for a balance in educational aims that address not only occupational, but also personal and civic domains that fit within the context, reality, and needs of the 21st century. Both educators argue that the structure and practices of an educational system should mirror the structures and practices in a democracy. With this concept of education in mind, Dewey explained, "education is a process of living and not a preparation for future living" (Dewey, 1897, p. 78). Thus, a democratic education involves learner-centered, experiential learning pedagogy that encourages not just relevant material, but provide students with the opportunity to directly practice agency and actively apply their learning so that it contributes to their current environment and circumstances. Such an authentic and agentic education, thinkers such as Dewey and Noddings argue, encourages individuals to both realize their individual potential and conduct their lives in a manner that contributes to a democracy and the betterment of society. (Dewey, 1938; Noddings, 2013). Moreover, Dewey emphasized the importance of developing agency (he referred to as self-governance) for sustaining a healthy democracy so adult members of society could not be easily and "arbitrarily ruled by political bosses" (Dewey, 1909, p. ix).

Many argue dissonance exists between the current industrial structure of schooling and the democratic personal and civic aims that intend to foster agency, authenticity, discussion, and

cooperation (Couros, 2015; Khan, 2012; Noddings, 2013; Robinson, 2009; Rudenstine et al., 2018; Sturgis & Casey, 2018; Wagner & Dintersmith, 2015). For instance, educator Matthew Brynes (2018) articulates:

> Many schools have struggled to create more meaningful social learning for their students because they are constrained by the structures of our traditional school paradigm – the accumulation of credits, grade levels, classroom architecture, hidebound curriculum, the ranking and sorting of students, the illusion of meritocracy, and deeply held cultural beliefs about competition. (Brynes, 2018)

Certainly, many educators strive to and do instill meaningful, liberating experiences for their students, but the traditional, industrial structures described by Brynes inhibit this full realization. For instance, educator Ken Robinson states "if you design education to resemble a factory, don't be surprised when it behaves that way." (Roger, 2018). Correspondingly, Dewey admitted that "the manner in which the machinery of instruction bears upon the child…really controls the whole system." (Dewey, 1902, p. 22-23). The traditional model of schooling relies on external motivation, compliance, and comparative success, which are at odds with aims of education that seek to promote cooperation and motivate learning for their intrinsic personal and societal benefits. These values of the industrial model of education are exacerbated by an overemphasis on economic aims manifested by an often-narrowing curriculum and the overvaluation of test scores. The disproportionate focus on occupational aims, educators Noddings (2013) and Ravitch (2020) argue, comes at the expense of personal and civic aims.

The structure and goals of both the industrial school model and neoliberal-influenced educational policy are in conflict with broader democratic and self-empowerment aims of education. As a result, competency-based education has been promoted as a potential means to

dismantle industrial-inspired structures such as the Carnegie unit, expand definitions of academic success related to personal and civic aims, deliberately develop student-agency (self-governance), and foster more student-centered learning pedagogy (Scheopner Torres et al., 2018; Sturgis & Casey, 2018).

Equity

Competency-based education has also gained large support for one of its primary aims – addressing issues of inequity (Casey, 2018, Lewis et al., 2014; Scheopner Torres et al., 2018). Systemic racism and increasing inequality are significant, current, critical challenges which public education can play a role in both perpetuating and alleviating (Bowles, 1976; Larabee, 2014). Although the national graduation rate has been increasing from 79% in 2010-2011 to 86% in the 2018-2019 school year, inequalities exist amongst groups. Graduation rates are as follows: White (89.4%), Asian/Pacific Islander (92.6%), Black (79.6%), Hispanic/Latino (81.7%), Native American (74.3%), students with limited English proficiency (69.2%), and students with disabilities (68.2%). Graduation rates amongst Black, Hispanic/Latino, and White students have risen by 13%, 11%, and 2% respectively since 2010-2011 (*2020 Building a Grad Nation Report*, 2020), but apparent differences amongst these groups still necessitate critical attention.

Moving beyond graduation rates, questions arise on how well students that graduate high school are prepared for college and careers. In 2013-2014, 60% of students starting two-year colleges and 32% of students starting public four-year colleges required one or more remedial courses. Only about half (or even less) of these students completed this prerequisite coursework. Furthermore, students of color disproportionately take remedial courses. (Chen, 2016; Chu et al., 2021; "Developmental Education FAQs," 2021) Graduation rates and remedial coursework were chosen in this section as measures to highlight disparities, but there are numerous additional

measures and examples of inequity across racial and ethnic groups in the United States that are both present in and impacted by education (Kendi, 2019; Tough, 2013, 2019).

Supporters of competency-based education advocate for the model's potential to address problems related to equity in education. First, competency-based education strays from a one-size-fits all monocultural approach that rather meets students where they are in their learning to more easily progress (Rudenstine et al., 2018). Second, many argue that characteristics of competency-based education, such as the one described above, more easily support culturally relevant and sustaining pedagogy (Peoples & Foster, 2019; Rudenstine et al., 2018; Sturgis & Casey, 2018). Third, a system that ensures students have met mastery should decrease the remedial courses required by entering first-year students to colleges and better guarantees that all students are competent in the skills required for the workforce. Despite support related to equity, currently a significant lack of empirical research exists that explores the implementation and outcomes of competency-based education that can confirm these hypotheses (Evans et al., 2019; Lewis et al., 2014; S. Ryan & Cox, 2017; Scheopner Torres et al., 2018).

In order to appropriately address equity and its relation to competency-based education, recent failures in educational policy and the dynamic between society and education should be discussed. Over the past decades a unidirectional belief that education is the primary cause and fix for societal problems has underlined policies such as No Child Left Behind (NCLB) as well as billions of dollars of investment into the privatization and corporatization of public education, which has demonstrated almost no improvement in its primary focus – test scores (Hanauer, 2019; D. Ravitch, 2020). Education and society are reciprocal institutions where education influences society, and society influences education (Dewey, 1909, 1916; Noddings, 2013). For instance, it has long been established that socioeconomic status, a non-school level factor, is the

best predictor of academic achievement. Further, Chetty and colleagues (Chetty et al., 2014) demonstrate that local geography and the make-up of one's local community beyond just the institution of the school plays a substantial role in economic upward mobility. School level reforms can play a role in addressing inequity, but these interventions should be understood in a broader historical, societal context. For example, as mentioned above, Chetty and colleagues (Chetty et al., 2014) establish various non-school related factors correlated to upward economic mobility, but they also establish school quality and teacher quality as one of the most highly correlated potential mediators of improving economic mobility. Thus, education is a lever, not the only button that can address societal inequity.

Economics

The competency-based movement, especially as it connected to educational policy, has been heavily driven by preparing young persons for a new and changing modern economy (Scheopner Torres et al., 2018; Sturgis & Casey, 2018). As mentioned previously, 32% and 60% of students entering two-year colleges and public four-year colleges respectively required one or more remedial courses in 2013-2014, resulting in a total cost to families of $1.6 billion (Dannenberg & Barry, 2016). In addition, employers and colleges report that recent high school graduates often lack critical skills for success (*110 ILCS 148 / Postsecondary and Workforce Readiness Act*., 2016; *Rising to the Challenge Survey, Part One*, 2014). According to a survey by Achieve (*Rising to the Challenge Survey*, 2014), the percentage of employers reporting that public high schools adequately prepare students for the workforce fell from 49% in 2004 to 29% in 2014. Similar patterns are observed for professors rating college students as well.

A static industrial education model alongside an evolving modern economy has led to a mismatch between continued narrow academic outcomes and the critical thinking skills that

students require today. For instance, although K-12 public education has traditionally emphasized recalling information, memorization is largely obsolete with the internet. Jobs that involve algorithmic (and now even heuristic) tasks face increasing automatization. (Wagner & Dintersmith, 2015). Furthermore, educator Jane Gilbert contends knowledge in the modern economy, has shifted from a *noun* to a *verb*; knowledge is now a *process* of utilizing information (Gilbert, 2005). The majority of jobs require creative, critical, heuristic thinking in an array of skills or competencies (Pink, 2009; Wagner & Dintersmith, 2015). Lastly, not only has the economic landscape changed, but it has become increasingly harder to predict as well. New jobs will arise and new skills will be in demand that will likely require people to employ independent learning strategies to update and adapt their skills throughout their careers (Wagner & Dintersmith, 2015).

Most states across the country, particularly the Northeastern states, in order to improve postsecondary readiness for students, have adopted some form of legislation around competency-based education ("CompetencyWorks Policy Map," 2018). The first competency-based legislation, LD1422, An Act to Prepare Maine People for the Future Economy (20-A MRSA, 2012), was the first enacted in 2012 to require proficiency-based graduation requirements by 2017. However, since then, subsequent legislation has been passed that allows schools to choose between using the traditional Carnegie unit for graduation requirements or proficiency-based requirements (20-A MRSA §4722-A, 2018). In Illinois, the Postsecondary and Workforce Readiness Act (110, ILCS 148/5, 2016) aims to (1) reduce the number of Illinois first-year college students that require full-time remedial coursework (almost 50%), and (2) to better prepare students with the skills needed for today's workforce and high-demand jobs.

Learning Sciences

In addition to philosophical, equitable, and economic aims, competency-based education is also promoted from a stance of best-practices in teaching and learning. The field of psychology dedicated to researching learning has established a strong evidence base over the past decades on how people best learn (Sturgis & Casey, 2018). Supporters of competency-based education assert a strong mismatch exists between advancement in the learning sciences and the teaching and learning practices that an industrial schooling model most easily allows for (Casey, 2018; Sturgis & Casey, 2018). A competency-based model, proponents argue, more closely aligns with the learning sciences. For instance, teaching and learning practices within a competency-based model that match with the learning sciences include the integration of students' backgrounds, establishing intrinsic motivation for learning, individualized pacing, effective utilization of formative assessment, and the application of knowledge in deeper learning experiences. (Rudenstine et al., 2018; Scheopner Torres et al., 2018; Sturgis & Casey, 2018).

Problem Statement

Although there have been countless education reform movements, the core industrial framework of the school characterized by the Carnegie unit and compartmentalized grades, subjects, and class periods, has historically been largely resistant to change (Tyack & Tobin, 1994). Competency-based education is a growing movement in education that seeks to transform these very structures. Although the current movement is relatively new, competency-based education and the theory behind it, mastery-learning theory, is not. However, past competency-based attempts have not been successful at scale. Despite the recent resurgence in K-12 competency-based education in in the past decade, the enormity and complexity of the reform

along with historical context of past reforms present an ambitious challenge for the success of competency-based education.

Considering the current competency-based education movement is in its early stages, a large absence of quantitative research exists on its the effectiveness (Evans et al., 2019; S. Ryan & Cox, 2017; Scheopner Torres et al., 2018). Some qualitative research is beginning to emerge exploring implementation, but it is also limited. The research that does exist indicates several challenges that include: aligning to state mandates; establishing proficiencies; fidelity, changing to new teaching practices; workload for teachers; and providing flexible scheduling and differentiated support (Evans et al., 2019; Philhower, 2017; Scheopner Torres et al., 2018; Shakman et al., 2018; S. C. Sullivan, 2016; S. Sullivan & Downey, 2015; Toland, 2017).

The specific problems in the field will be identified in relation to the core principles of competency-based education (Patrick, Sturgis, & Pettinger, 2011), particularly proficiency-based explicit measurable, transferable objectives (principle 2), rapid and differentiated support (principle 4), and application of authentic knowledge (principle 5). First, developing sound proficiencies (principle 2) has been a hurdle for 1st generation competency-based education schools. For instance, Karen Shakman and colleagues (2018) found that even after five years, Maine schools had not made much progress in competency-based implementation because of time needed for and difficultly in creating proficiencies, especially with little guidance from the state. For the schools under review in their study, only 20% of students actually experienced moderate levels of competency-based learning. In her phenomenological case study, Catherine Toland (2017) discusses that although Vermont social studies teachers were proud of their work in developing sound proficiencies, the work was a significant challenge that involved continual revising. Further, although competency-based education calls for skill-based proficiencies, many

competency-based schools reviewed by the author at the time of this study used many content-based standards, especially in subjects such as science and history.

Second, although many competency-based schools have policies that allow students to progress upon mastery, the literature and personal correspondence with teachers from multiple competency-based schools reveal difficulty in providing the rapid differentiation (principle 4) for students to move ahead, and to help students that have fallen behind (Evans et al., 2019; Toland, 2017).

The fifth criterion of competency-based education, the application of authentic knowledge, is virtually missing from the literature. References related to authenticity are present in a few studies (Philhower, 2017; Toland, 2017), but no studies were found that specifically focused on exploring and providing in-depth evidence related this principle. As discussed in the prior section, a progressive education that aims to develop the whole student and foster a flourishing democratic society should promote empowering learning experiences that encourages students to have agency in applying learning in authentic relevant ways (Dewey, 1916, 1938; Noddings, 2013).

Related to the challenges of proficiency-based assessment, rapid and differentiated support, and the importance of the authentic application of knowledge, recent work in the competency-based education field has focused on a new mode of proficiency-based assessment called *competencies*. Competencies are transdisciplinary, skill-based proficiencies that do not include a generalized, arbitrary level of proficiency (typically indicated as a score of 3), but rather clearly describe what proficiency entails on a continuum of performance levels ranging from kindergarten to college. A student's performance level on a competency is *measured* by how well they meet the *explicit* performance level descriptors that become increasingly rigorous

as the continuum of performance levels progresses. Competencies are *transferable* as they can be completed across disciplines and they extend beyond typical academic subjects. For instance, a competency set may include skills such as *Lead one's Own Learning, Conducting Research,* and *Collaborate on Teams*.

Competencies have multiple characteristics as described by educator Sydney Schaef (2016). Competencies are built on the philosophical foundations of John Dewey and Benjamin Bloom where learning should be meaningful and relevant to the circumstances of the learner. Therefore, competencies are designed to be completed via a performance task, rather than a traditional paper and pencil test. Additionally, unlike typical standards that include specific discrete knowledge, competencies sit above standards in terms of grain size and include multiple skills. For instance, a competency such as *Engaging in Inquiry* may include skills such as: *Asking questions, Defining variables,* and *Determining method of data collection*. Next, competencies are skills that are content agnostic; they are not tied to a particular content or subject and therefore can be used across multiple disciplines. Traditionally, once a standard that is typically content-based, such as *Describe various methods of heating,* is mastered students are unlikely to return to the standard. Competencies are intended to be repeated across disciplines and years while increasing the level of rigor so that students gain continual exposure and practice with them.

Competency-based education seeks to transform the industrial model of education to better meet the occupational, personal, and civic purposes of education in the 21st century. To accomplish this, Sydney Schaef argues for a competency-based model that does not simply increase efficiency within the traditional system, but seeks to transform the system itself. In the

article *What IS the difference between competencies and standards?* Schaef (2016) quotes her colleague Antonia Rudenstine:

> Standardized learning is the hallmark of the industrialized education model of the 19th century. If the principles of competency-based education are unable to reshape the system itself…it is likely that students will continue to be sorted by, and shuffled through, an education system that is designed for efficiency, not equity...[For instance], although [a personalized online program] may meet [students] where they are academically, ultimately, they are going to the same [narrow] place…We need competencies to define a more holistic vision for learners. (Schaef, 2016)

Competencies offer a potential structure to address neglected personal and civic aims of education, while also providing greater congruence with economic needs. Yet, of all the studies reviewed, none investigate competencies as described above. Therefore, proficiencies, particularly skill-based, transdisciplinary competencies that seek to address challenges in proficiency-based assessment and aim to deliberately encourage the authentic application of knowledge requires attention in research.

Purpose Statement

The purpose of this qualitative case study was to investigate an educational organization with the pseudonym The Core Project and the two schools it works with that have adopted competencies. Specifically, this case study sought to explore the implementation of competencies at these schools and focus on their influence on teacher practice. This study also looked to identify challenges in both using and implementing competencies as well as general challenges related to the school's particular competency-based model.

Research Questions

This study explored the implementation of competencies at The Core Project and the two schools affiliated with it. The research questions were as follows:

1. How are competencies employed?
2. How do competencies influence teacher practice?
3. What are the challenges experienced related to the competencies and the competency-based model in general?

Rationale and Significance

Educators and schools are in the early stages of determining how to best implement competency-based education. This is the first study known to specifically investigate competency-based schools that use skill-based, transdisciplinary competencies across a continuum. Thus, this case study can provide researchers, administrators, and teachers with a familiarity and understanding of this new mode of proficiency-based assessment. Additionally, the study can illuminate characteristics, successes, and challenges that a competency-based school encounters, and specifically encounters with competencies, which can inform new and evolving competency-based implementation efforts.

Competency-based education explicitly seeks to transform the traditional model of education, rather than to simply improve its efficiency (Schaef, 2016; Sturgis & Casey, 2018). Although the model promotes expanding measures of academic success (Scheopner Torres et al., 2018), but much of the research thus far has focused on logistics of implementation, rather than on the fifth principle, the authentic application of knowledge. Thus, school systems may be better-engineered to meet students where they are, but the current narrowed aims of the system may remain in place. Research concerned with the principle of authentic application of

knowledge can expand the conversation of competency-based education towards a more holistic vision for learners driven by personal, civic, and occupational aims. Further, educators can use this research to evaluate the extent to which competencies may be a structure that can support these aims.

This study purposefully intended to explore how teacher practice is influenced by competencies. Interestingly, there is little evidence that new assessment and accountability systems promote fidelity in competency-based teaching practices beyond assessment practices themselves (S. Ryan & Cox, 2017). However, the deliberate design of competencies to focus on skills and redefine academic measures of success, may provide evidence that indicates otherwise. In addition, some, but overall little research has been found detailing teacher practice with competency-based education. The findings from this study can contribute to clarifying a currently foggy picture of what teacher practice looks like in a competency-based learning environment. In the limited amount of literature that does exist on teacher practice, despite a consistent belief in and support for competency-based education, many teachers felt overwhelmed and ill-prepared. Thus, professional development is strongly recommended. (Casey, 2018; Gross & DeArmond, 2018; Shakman et al., 2018) Exploring competencies and their influence on teacher practice and beliefs in a competency-based school can also provide needed insight to inform professional development efforts.

Definition of Key Terms

This research focuses on the field of competency-based education, often in which different words are used for the same concept, and in other instances, similar words refer to separate concepts. For instance, proficiency-based learning and competency-based learning although sounding different are referring to the same concept. However, proficiency-based

learning and proficiency-based grading, although sounding similar, refer to two different concepts. Therefore, it is important to establish terms that will be used throughout this paper. For the purposes of this research, the following terms are defined.

Traditional Education

Traditional education refers to structures and teaching methods that have been in place since the factory model of public education was developed during industrial revolution. Structures and practices that are part of traditional education include: advancing by seat time (the Carnegie unit), age-based grades, bell-periods, a divided, standardized, and knowledge-based curriculum, and a teaching paradigm where the teacher is the *deliverer* and the students are the *receivers* of knowledge (Sturgis & Casey, 2018; Tyack & Cuban, 1995).

Proficiency-Based Assessment (grading)

Proficiency-based grading (assessment) is a mode of assessing and reporting that is intended to communicate progress towards mastery by (1) establishing clear learning objectives and descriptions detailing mastery, (2) separating academic achievement from behavior, and (3) supporting formative assessment (Gobble et al., 2016; *Proficiency-Based Grading Parent Information*, 2017). Instead of a student receiving an 89% on a test, a proficiency-based grade more clearly communicates if a student is proficient in a skill and clarifies why or why not with reference to descriptors for that proficiency. Student understanding of a learning target is typically communicated by the codes: 1 – not meeting or just starting to develop proficiency, 2 – working towards or approaching proficiency, 3 – proficient, and 4 – exceeds proficiency (Gobble et al., 2016; Shakman, Foster, Khanani, Marcus, & Cox, 2018). Proficiency-based grading may also be referred to as: *proficiency-based reporting or assessment*, or *standards-based grading*.

Competency-Based Education

Competency-based education refers to an educational model where students advance on meeting proficiency in knowledge and skills instead of seat time. Four additional core elements include (2) proficiency-based objectives that are explicit, measurable, and transferable, (3) assessment that is meaningful and a positive experience to both (a) propel understanding and (b) empower students, (4) rapid, differentiated support is provided to students who do not meet proficiency, and (5) learning outcomes emphasize the application and creation of authentic knowledge. Competency-based education is also referred to as: *proficiency-based learning* or *mastery-based learning*. (*Iowa Department of Education Guidelines*, 2016; Patrick, Sturgis, & Pettinger, 2011; Sturgis & Casey, 2018; Sullivan & Downey, 2015).

Personalized Learning

Personalized learning refers to an approach to instruction paced to learning needs and tailored to the specific interests of individual learners. In other words, personalization focuses on *differentiation* and *individualization*. Competency-based education and personalized learning have many overlapping features that "are mutually reinforcing and in many cases inextricable" (Casey & Sturgis, 2018, p. 3). However, personalized learning, despite its greater familiarity in the educational community, can lack a level of conceptual clarity and have a wide range of definitions or methods of implementation. Under the wide umbrella of personalized learning, learning preferences and styles have been emphasized which the psychological community has convincingly discredited (Pashler et al., 2008). Therefore, although personalized learning is connected to competency-based education by *differentiation* and *individualization* predicated on learner interests and culturally relevant and sustaining pedagogy, it is also important to

disconnect characteristics of personalized learning such as learning preferences and styles from competency-based education.

Authentic

Authentic describes a learning experience in which learners engage and participate in tasks and issues that closely mirror how they engage in the world civically, personally, and occupationally (Casey & Sturgis, 2018; Dewey, 1916; Villarroel et al., 2018).

Competency

A competency is a skill-based, transdisciplinary performance expectation (or learning objective) that falls along a continuum of performance levels. Competencies themselves do not establish a common arbitrary level of proficiency, but rather describe what success at a continuum of performance levels entails. In this study, all of the criteria used to describe competencies need to be met in order for an objective to be considered a competency. For instance, although the term competency may be used in the literature, if the learning objective does not fit all criteria defined by above, the term standard will be used accordingly. Also, although the term skill-based, transdisciplinary competency is a redundant term, in this study it will sometimes be used to emphasize and to distinguish competencies from standards. One last note, the set of competencies investigated in this study were assigned or associated with typical academic disciplines, but could be and were used across disciplines – which still meets the criteria of transdisciplinary for this study.

Continuum

A continuum is a rubric that includes indicators describing what entails mastery at varying performance level for a single competency. Because there are multiple competencies, the term *continua* will also be used referring to a whole set of competencies a school uses.

Standard

A standard is a learning objective that can include knowledge criteria or a skill or performance expectation that is linked to a specific discipline. For the purposes of this paper, any learning objective that does not meet the criteria of competency described above is considered a standard. For instance, an objective may be skill-based, but if it establishes one common level of proficiency (usually indicated as a 3) instead of a continuum of performance levels, it is considered a standard.

Organization of the Dissertation

This chapter provided background on competency-based education along with important educational aims to consider, introduced the problem, purpose, and research questions, explained the study's rationale and significance, and clarified relevant terminology. This dissertation is organized into four additional chapters. Chapter II includes the theoretical framework, a brief history of competency-based education, a synthesis of the arguments for competency-based education relative to traditional education, and a review of the current literature on the implementation of 1st generation competency-based schools. Chapter III outlines the methodology, methods of data collection, and data analysis in this case-study, and Chapter IV reports on the findings. The dissertation concludes with Chapter V in which the findings are discussed alongside implications and recommendations for practice, policy, and further research.

Chapter II: Review of Literature

Introduction

This chapter intends to first provide a knowledge-base and context on competency-based education and a review of the literature in the field. First, the theoretical basis behind competency-based education is discussed followed by an in-depth explanation of how competency-based education seeks to improve upon traditional structures of education. Then, a brief history of competency-based education is provided to give context to the current competency-based movement today. Finally, a review of literature is presented on the current implementation of competency-based education in secondary schools.

Theoretical Framework

The design of learning systems should be built around what the learning sciences have determined is most effective and what best engages and motivates students (Casey & Sturgis, 2018). The theoretical basis for this research is built upon *mastery learning theory* and *self-determination theory*.

Mastery Learning Theory

Mastery learning theory was proceeded by two important ideas on learning. In 1949, Ralph Tyler argued against curriculum designed for what teachers should present and argued that curriculum should be designed for what students should be able to do (Tyler, 1949). Second, Robert Glaser (1962) differentiated between norm-referenced and criterion referenced assessments. For instance, instead of using assessment for measuring an individual along a bell curve (norm-referenced), Glaser argued that assessment should measure a student in relation to the learning target as 'competent' or 'not-competent' (criterion-referenced).

Building on these ideas, in 1963, John B. Carrol introduced mastery-learning theory reasoning that "the learner will succeed in learning a given task to the extent that he spends the

time that he needs to learn the task' (Carroll, 1963, p. 725). Aptitude, according to Carroll, was not the ability to learn a task. Rather students with higher aptitudes in a particular area are simply able to master an objective in less time. Thus, students with lower aptitudes in a particular area can still master an objective, but simply require more time (Carroll, 1963). Contrary to the predominant thinking of his time, Carroll introduced the important belief that all students can learn (Bloom, 1968; Philhower, 2017).

Benjamin Bloom supported Carroll's work on mastery learning theory stating that the notion that all students can learn is clearly evident by the fact that although a fraction of students may achieve high mastery in a given grade year, in the following years all students will have reached the same level of mastery. By measuring performance in a fixed amount of time, in a given school year typically only one third of students *succeed*, the bottom third *fail*, and the middle third barely attain an adequate level of education. (Bloom, 1968; Hodge, 2007) Bloom supported Carroll's initial propositions by showing that with tutors, 95 percent of students could reach mastery, which was two standard deviations away from conventional instruction. Although Bloom admitted that providing individual teachers for each student is not feasible, the results clearly demonstrate that students can master an objective if given the time and supports. Bloom, along with his graduate students, researched different methods that could be more practically employed in the classroom to move more students towards mastery. Such interventions included: (a) formative assessment (which they termed mastery learning at the time), (b) relearning prerequisites before beginning a new learning objective, (c) cooperative learning, (d) and identifying students falling short of mastery and providing them with customized instruction more suited to their individual needs. These interventions were able to bring many more students up to the desired standard of achievement with compelling effect sizes. (B. S. Bloom, 1984)

Self-Determination Theory

Motivation is critical to understand and foster in schools considering a recent Gallup poll that indicated from 5th to 8th grade student-reported engagement drops from 75% to 45%, and from 9th to 12th grade student reported engagement drops from 41% to 34% (Gallup Student Results, 2015). Motivation can be separated into extrinsic and intrinsic motivation. Extrinsic motivation relies on rewards, grades, and approval in order to engage in a task, while intrinsic motivation involves engaging in task for its inherent satisfaction (R. M. Ryan & Deci, 2012). For algorithmic tasks, extrinsic motivators are considered effective. However, for heuristic tasks that are novel, require creativity, and have multiple solutions, extrinsic motivators are highly detrimental to the completion and success of such tasks. Rewards narrow an individual's focus in solving a problem when creativity requires an individual's focus to be widened. Instead of extrinsic motivators, there is large consensus in the psychological field that intrinsic motivation promotes the heuristic tasks that are required by most jobs today and a skill-based school curriculum (Pink, 2009).

Examining intrinsic motivation further, self-determination theory has been constructed and supported by decades of research by Ryan Deci and Richard Ryan and postulates that humans have innate psychological needs, and are thus motivated to satisfy these needs. Within every person is an innate inner-drive to be autonomous, competent, and to experience relatedness (purpose).

Autonomy. Autonomy is the "capacity for and desire to experience self-regulation and integrity" (Ryan & Deci, 2012, p. 85). Those that have autonomy have can be causal agents in their own life (R. M. Ryan & Deci, 2012). Autonomy maximizes creativity and problem solving, and students that are given more autonomy in school have better understanding of concepts,

better grades, enhanced persistence at school, less burnout, and overall higher well-being (Pink, 2009).

Competency. Competency involves developing mastery in tasks of perceived importance. Simply stated, it feels good and is motivating to experience success in a task. Individuals are particularly motivated when the task they are working on rests in a *sweet spot* that lies just outside one's own existing level of mastery (Csikszentmihalyi & Csikszentmihalyi, 1992; Pink, 2009).

Relatedness. As social animals, humans need to feel connected to others (Ryan & Deci, 2012). Daniel Pink frames this category developed by Deci & Ryan in a different light identifying it as *purpose* (Pink, 2009). A sense of belonging to a community and the belief that the work one is engaging has value is critical to student engagement (Farrington et al., 2015). School can be difficult for many students to pursue because its goals are not immediate and not completely concrete. The absence of a directly tangible or relevant goal makes it difficult for any individual to maintain motivation (Tough, 2013). However, when a person wakes up each day hoping to "make the world a better place by doing X" or to "to be a better person by doing Y," their capacity for achievement increases greatly (Pink, 2009, p. 54) Moreover, individuals that seek personal growth and to develop meaningful relationships have lower anxiety and overall greater well-being compared to extrinsically motivated individuals (Ryan & Deci, 2012).

The Case for Competency-Based Education

In Chapter I, issues were introduced pertaining to personal, democratic, equity, and economic aims in K-12 public education. What then, are the tangible, identifiable structural flaws within the traditional education system that pertain to these aims? Using 10 flaws developed by Sturgis and Casey (2018), I present an adapted and simplified framework of four

flaws, each accompanied by an explanation on how competency-based education (abbreviated as CBE in headings) intentionally addresses them. To support this section, numbers 1-5 will be shown in parentheses to relate how the components of competency-based education contribute to addressing these four flaws in traditional education. To reiterate the components, competency-based education includes: (1) students progressing upon mastery, (2) objectives that are explicit, measurable, and transferable, (3) assessment that moves learning forward, (4) rapid and differentiated support and (5) the authentic application of knowledge (Patrick, Sturgis, & Pettinger, 2011).

Flaw #1: Students Progress Based on Seat Time

It is necessary to step-back and challenge assumptions we make about education because *it has always been that way*. Not even 200 years ago, many of the central structures to the industrial model of education we assume are standard would seem strange and foreign to anyone at that time. Rudenstine and colleagues (2018) challenge the assumption that age-based approaches are fair and valid. Designed for efficiency, the traditional system is *successful* in moving students along from grade to grade. Learning is judged by how much students are able to achieve in the same amount of time. In this model, time is the constant and learning is subject to variability (Philhower, 2017). Students advance to the next grade level with major gaps in understanding making it difficult for future learning without having mastered necessary perquisite knowledge and skills (Bloom, 1968; Khan, 2012; Sturgis & Casey, 2018). The traditional system directly contradicts Carroll and Bloom's mastery learning theory which asserts that all students can learn if given enough time (B. S. Bloom, 1984; Carroll, 1963). As a result of variability in learning over an allotted period of time, grading becomes a sorting process automatically creating *winners* and *losers*. (Dewey, 1909; Sturgis & Casey, 2018). Further, from

high-stakes tests that are taken in grammar school, students are placed in tracks that can have enormous consequences for their entire education path and career path. These tracks become self-fulfilling prophecies of academic achievement and perpetuate inequity. (Khan, 2012; Wood, 2010)

CBE: Students Progress Based on Proficiency

Replacing the Carnegie unit of seat time, in competency-based education students only progress if they have demonstrated mastery (principle 1). Inevitably, some students will fall short of a learning object, which is why competency-based education requires extensive system-wide rapid differentiated support (principle 4) for those who do not meet proficiency (*Iowa Department of Education Guidelines*, 2016; Patrick, Sturgis, & Pettinger, 2011; Sturgis & Casey, 2018).

Flaw #2: Faulty Grading Practices

The traditional grading system lacks reliability, consists of opaque learning objectives, and lacks validity. Concerning reliability, although it may seem objective, points allotted to an assessment during its creation are arbitrary, and great variability exists on what constitutes, for instance, a 90% for a given class or teacher (Sturgis & Casey, 2018). Learning objectives in the traditional system are opaque as a letter grade or percentage becomes a proxy for communicating level of proficiency and it is difficult for stakeholders to use such data for formative purposes (Gobble et al., 2016; Sturgis & Casey, 2018). Finally, traditional grades rarely measure learning validly, as a final grade ends up being an average across homework, participation, tests, quizzes, etc. Such measurement makes it difficult to discern if a student's performance is the result of behavior or mastery of the material (Gobble et al., 2016; O'Connor, 2011; Sturgis & Casey, 2018).

CBE: Explicit, Measurable, Transferable Learning Objectives

Instead of unreliable, opaque, invalid learning objectives, in order to ensure students have truly mastered learning, in a competency-based system learning objectives should be explicit, measurable, and transferable (principle 2). Therefore, proficiency-based assessment (grading) is a core component to competency-based education. Educators establish objectives for what students are required to do and establish clear success criteria for what constitutes proficiency. Grades are used to reveal progress towards mastery, and, as a result, assessment is intended to be meaningful and a positive learning experience for propelling understanding (principle 3). Moreover, assessment is also intended to empower students (principle 3). With clear learning objectives and feedback, students are given a greater opportunity to practice agency in self-assessing and self-directing their learning. (Gobble et al., 2016; *Iowa Department of Education Guidelines*, 2016; Patrick, Sturgis, & Pettinger, 2011; Sturgis & Casey, 2018)

Flaw #3: Narrow Academic Outcomes

It is necessary to challenge the assumption that that academic-centric content knowledge is an adequate or the sole way to define student success (Rudenstine et al., 2018). Academic success in traditional schools is largely confined to academic skills, memorization, and comprehension of content (Sturgis & Casey, 2018). Today, such highly academic outcomes are not even adequately preparing college-bound students (Casey & Sturgis, 2018; Dannenberg & Barry, 2016).

CBE: Authentic Knowledge and Skills

Alternative to narrow academic outcomes, success in competency-based education is broadened and redefined for multiple outcomes besides that of just academia. In addition to academic content and skills, success is also widened to include transferrable dispositional skills,

as well as social and emotional competencies. Correspondingly, expanding to not just what is assessed but how learning is assessed is especially important for the purpose of this paper; competency-based education stresses that learning outcomes emphasize the application and creation of authentic knowledge (principle 5). (*Iowa Department of Education Guidelines*, 2016; Rickabaugh, 2016; Patrick, Sturgis, & Pettinger, 2011; Sturgis & Casey, 2018)

Flaw #4: Compliance

To maximize efficiency, the regimented, orderly, hierarchical traditional system requires compliance (Khan, 2012), also making it difficult to support inclusivity and cultural responsiveness (Sturgis & Casey, 2018). Students typically have little agency in how they approach learning or demonstrate mastery. External motivators such as points, grades, and discipline consequences shape this compliant behavior. This lack of autonomy contradicts the learning sciences of how students engage and learn (R. M. Ryan & Deci, 2012; Stixrud & Johnson, 2019; Sturgis & Casey, 2018).

CBE: Empower with Agency

Competency-based education aims to make assessment a meaningful and positive learning experience to empower students (principle 3). (*Iowa Department of Education*, 2016). That is, by providing students with more autonomy and responsibility, they are able to become agents in their own learning and lives. Such encouragement of student voice, allows students to bring their interests, values, and culture into the classroom spurring greater culturally responsive teaching. (Rickabaugh, 2016; Sturgis & Casey, 2018)

Historical Overview of Competency-Based Education

Before exploring today's implementation of competency-based education, it is important to provide historical context to how we got here. During the 1920's, there was progressive push-

back to the highly systematic, and perceived by many as dehumanizing, public education system (Goldstein, 2014). In 1922 superintendent Carl Washburn implemented the *Winnetka Plan* at his high school in Winnetka, Illinois. The plan had two main pillars. The first pillar was the belief that all students could learn. The second pillar was that curriculum would not progress on prescribed time, but the ability for students to accomplish targeted levels of achievement. Students were able to move at their own pace and struggling students were provided with support. Despite the excitement by many progressive educators at the time, this new system soon lost momentum at scale (Khan, 2012). Khan (2012) attributes this failure to economic and normative factors. Concerning economics, the resources necessary to support the infrastructure that the relatively wealthy Winnetka school district could afford, Khan argues, could not be adopted by most American public schools. In addition, he also states the teacher training necessary to teach in a competency-based system was not given necessary funds. Relating to normative factors, in alignment with Tobin & Tyack's overall exploration into the failures of reform movements throughout the past century (Tyack & Tobin, 1994), Kahn also ascribes the failure of the Winnetka Plan to the sheer difficulty to shift the deeply rooted and established institution of public education. (Khan, 2012)

A new rise in competency-based education can be traced back to the 1957 launch of Sputnik, which sparked and legitimized the federal government's role in education. The lacking of technological innovation, Americans perceived, was a direct result of a lacking education system. Thus, Sputnik along with the addition of reports on employment difficulties and high drop-out rates in secondary schools, led to many federal educational initiatives in the following decades. Influenced by Carroll and Bloom's mastery learning theory and incentivized with government funds, the first model of competency-based education was developed in 1971 for

pre-teaching programs. (Hodge, 2007) Although this first phase of competency-based education soon fizzled out, a model had been established. In the same decade, 20 states began some form of competency-based programs in K-12 education, but these quickly failed as the *Great American Educational Fad of the 1970s* as described by education researcher William Spady (1977). Analyzing the failure in secondary schools, Spady commended competency-based education in theory, but argued the movement was uncoordinated and was never implemented with the intentionality and comprehensive degree required for success (Spady, 1977).

Although competency-based education did not succeed in pre-teaching programs and American secondary schools, a small, but significant number of higher education institutions began to adopt the model and focused primarily on adult learners. These college students were allowed to demonstrate proficiency in previously acquired skills gained from the workplace and work towards proficiency in not-yet-acquired objectives. Many of these post-secondary programs still exist today. (Nodine, 2016)

In the past decade, there has been a resurgence of competency-based education in both secondary and postsecondary education. Nodine (2016) argues that this revival is the result of a *perfect storm* of online technological advancements, increase in computer facilitated instruction, and pressure by policy makers to offer greater opportunities and lower costs for post-secondary education. Concerning K-12 education, as the writing of this paper, 49 out of 50 states have some competency-based education initiative, and 18 states have some comprehensive policy alignment with, or active state role to build capacity for, competency-based education in local schools (*CompetencyWorks State Policy Map*, 2019).

Although there is widespread state support for competency-based education, successful implementation is not guaranteed. Lead states such as Maine established a law in 2012 to soon

require proficiency-based diplomas (An Act to Prepare Maine People for the Future Economy, 2012). However, due to multiple difficulties in implementation, in 2018 this requirement was scaled back and Maine high schools now have the option to either require proficiency-based graduation requirements or continue to use traditional time-based Carnegie units (An Act to Ensure the Successful Implementation of Proficiency-Based Diplomas, 2012).

The concept of an institutional educational system that ensures students have learned what is intended for them to learn before progressing is simple, seems obvious, and has been around for a century. Yet, past initiatives to implement, scale, and sustain the concept have failed, and implementation remains a challenge in the beginning of the most recent competency-based movement today. Thus, researching the successes and challenges of what can be called the *1st generation of modern competency-based schools* (Rudenstine et al., 2018) is vital for ensuring successful reform today.

Literature Review

Methods of Review

Literature examining competency-based education was generally narrowed to high schools (although some studies included K-12 schools). Considering personalized learning and competency-based education "are mutually reinforcing and in many cases inextricable" (Casey & Sturgis, 2018, p. 3), some articles used the term personalized learning, but were in effect investigating competency-based schools. Also, there is a wide range to the level of fidelity and how implementation is executed at competency-based schools. Thus, the author reviewed research that specifically explored schools that were actively implementing systems intended to allow students to (1) demonstrate mastery with proficiency and also (2) provide some degree of flexibility in pacing to obtain mastery.

Competency-based Education and Achievement

Little quantitative evidence exists on the effect of competency-based education on achievement. However, a few studies will be examined to indicate some insight into competency-based education and demonstrate the difficulty, at present, in measuring the efficacy of competency-based programs due to lack of fidelity.

Studies looking at specific schools on competency-based education are limited, but do show some initial promise. A case study by Sullivan (2016) reported that English proficiency on state measurements increased from just 40% to 55% in three years at the school under study. Over the same period, gains were even greater for the high school's migrant and English Language Learners (ELL) at 50%.

Basham, et al. (2016) conducted a mixed methods study of a large urban-reform school district of 6,180 students implementing personalized learning that allowed students to advance upon mastery. Researchers found that 25% of students had already shown 1-year's growth after just one semester. By the end of the school year, in mathematics, 65.1% of students made at least 1-year growth, and of that group, 38.5% met 2-year growth. In English language arts, 61.3% of students made at least 1-year growth, and, of that group, 50% met 2-year growth. In summary, around half of students demonstrated 2 years of growth with personalized learning. Additionally, negligible effect sizes were found in achievement in students with IEP's compared to no IEP's. Basham and colleagues concluded that personalized learning environments can be places where students with disabilities can thrive. Despite these promising results, it must be noted that 40% of students still did not meet 1-years growth in math and reading. Thus, this study presents both promising evidence for the potential of personalized learning for increasing academic achievement, but indicates challenges for ensuring all learners achieve academic success.

Just before the Maine law to require proficiency-based graduation requirements was scaled back in 2018, a mixed method multi-site case study by Shakman and colleagues (2018) on Maine's competency-based implementation was released. The report, sampling 11 rural schools totaling 2,270 students, found that only 20% of students experienced moderate levels of proficiency-based learning. Further, students that experienced proficiency-based learning still experienced largely traditional teacher-directed teaching methods. Shakman and colleagues' study illustrates that with many schools not fully employing competency-based education with fidelity at present, it may be challenging to currently gain valid and reliable results on achievement when implementation is not a reasonable constant.

Qualitative Research on 1st Generation Competency-Based Schools

It is difficult to measure the effect of a variable, when the variable itself, competency-based education, has not truly precipitated into practice in many schools and whose operational characteristics have not been fully established by researchers (Ryan & Cox, 2017). Therefore, there is value in examining the recently published qualitative and mixed-methods research exploring the early implementation of competency-based education to identify patterns, successes, challenges, and to determine best practices moving forward. The goal of this qualitative review is to create a picture of what the landscape of competency-based education in high school is at present. The literature in this review involves case studies that explore a wide range of schools, each unique in their own context, and each different in the extent to which they employ competency-based education.

Student Experience. A consistent finding across studies was an emphasis on learning at competency-based schools. With competency as the goal and measure for students (instead of points and grades), conversations with students centered around proficiencies (Shakman et al.,

2018; Sullivan, 2016; Toland, 2017). For example, Toland (2017) conducted a phenomenological case study of high school social studies teachers, and a major theme that surfaced was the shift of formative assessment to the center of learning. In this case, teachers reported assessments were viewed positively by students as a means to move forward towards explicit learning objectives. Several teachers at this school and others described the learning students were engaging in was deeper and more rigorous (Sullivan & Downey, 2015; Toland, 2017). It should be noted, however, that schools reported to have less fidelity in schoolwide implementation were reported to lack rigor (Gross & DeArmond, 2018). Other case studies highlighted students were more aware of what they were learning (Sullivan & Downey, 2015; Sullivan, 2016). For instance, an administrator at an alternative high school studied by Sullivan & Downey (2015) reported that one could ask any student in the hall what they were working towards and they could tell you, demonstrating a focus on learning and mastery.

Along with an emphasis on learning, multiple studies found an increase in student ownership of learning. (Basham et al., 2016; Philhower, 2017; Sullivan & Downey, 2015; Sullivan, 2016). Sullivan (2016) conducted a case study at a Lindsay High School in California specifically examining student voice and consistently found that setting and completing goals produced a great sense of pride and ownership for students. Similarly, from teacher interviews in a multi-site phenomenological case study, Philhower (2017) attributed a greater sense of student ownership of learning to the active role students played in goal setting, reflection, incorporating their interests in their learning, and choosing how they would demonstrate mastery.

Beyond a shift towards greater ownership of learning, other culture shifts were observed in case studies amongst students. Lindsay High School, investigated by Sullivan (2016), a decade prior had been challenged by discipline and academic issues, as well as gang problems. Students

and administration discussed the shift in culture and described the present culture as empathetic, with a sense of community within the school and for the town. Teachers interviewed by Toland (2017) described a culture shift in students having a positive view of receiving feedback from teachers. Students did not feel ashamed or judged by being *called back* for extra support and saw this process as a team effort between themselves and the teacher to move their understanding forward; a similar finding was also described at Lindsay High School (Sullivan, 2016). Finally, in a case study examining the first year of implementation at an alternative high school, teachers and administrators interviewed by Sullivan & Downey (2015) began to notice a culture shift in engagement and *buy-in* by the students.

Providing Rapid and Differentiated Support. Significant challenges have been present in the early implementation of competency-based education related to rapid and differentiated support (Evans et al., 2019; Philhower, 2017; Scheopner Torres et al., 2018; Shakman et al., 2018; S. C. Sullivan, 2016; Toland, 2017). A quantitative study by Evans and colleagues (2019) surveying 413 principals from Northeast states indicates a fair degree of personalized support interventions at schools, but flexible pacing and flexible assessment were reported as the least present competency-based practices. Turning to qualitative research, a school investigated by Philhower (2017) reveals difficulty in managing pacing especially in connection with more *content heavy* classes; similar challenges were found in other case studies related to pacing (Shakman et al., 2018; S. C. Sullivan, 2016; Toland, 2017).

Many schools from the case studies reviewed changed their schedules and other traditional structures to provide greater flexibility for systemwide differentiated support. Yet, overall, problems remained. Some schools implemented different versions of block schedules that allowed for more flexibility of how chunks of time were used (Sullivan, 2016; Toland,

2017). Others mirrored more of a college schedule giving students the needed time to work with teachers during unscheduled times and were attributed as factors of success (Philhower, 2017). Even with flexible block schedules observed by Toland (2017), teachers still conceded that they needed more *call-back* time to support struggling students. Similarly, Sullivan (2016) found that many students at Lindsay High School were frustrated with the limited time they had with teachers because the teachers spent most of their time *catching up* struggling students. In the Maine schools that Shakman (2018) investigated, flexible pacing was managed with retakes, carving out limited *flex time* within the traditional schedule and, in some instances, slowing the pace of the whole class so most students could obtain mastery within a *teacher-paced* time. In this same study, difficulty was also reported in accommodating students that had met mastery that should be able to move forward in theory (Shakman et al., 2018). To the extent to which flexible pacing had been successfully accommodated in schools, Sullivan (2016), Philhower (2017), and Basham et al. (2016) all emphasize that self-pacing was absolutely critical to the success that was observed amongst students in their case studies. However, as demonstrated above, sufficient structures for effective, systemwide flexible pacing was still a challenge for schools.

Another structure prevalent in many competency-based high schools related to differentiated support, (but also other educational purposes), was an advisory period. Advisory is a daily non-academic period serving the purpose of (a) building community (establishing student-student and student-teacher relationships), (b) explicitly teaching social and emotional skills, (c) and mentoring students in their learning progressions (Philhower, 2017; Shakman et al., 2018). These three components were present in all case studies that discussed advisory periods. (FSG, 2019; Philhower, 2017; Rudenstine et al., 2018; Shakman et al., 2018; S. C.

Sullivan, 2016; Toland, 2017). Sullivan (2016) highlights that mentoring during advisory involved goal setting that included not just academic goals, but family and postsecondary goals. Toland (2017) reveals that teachers reported that advisory periods were a necessary support structure that would need to evolve to help students document and reflect on their learning progress. Finally, at one of the schools examined by Shakman and colleagues (2018), social and emotional learning instruction during advisory intentionally and explicitly aimed to foster: effective communication, self-direction, life-long learning, creative problem solving, and integrative and informed thinking. Although not part of the five-part working definition of competency-based education (Sturgis, Patrick, & Pettinger, 2011), advisories appear to be an almost undetachable structure to support flexible pacing as well as the broader social and emotional aims that competency-based education intends to foster.

Teacher Experience. Competency-based education appears to lead to considerable changes in the work that teachers engage in. Teachers from multiple schools across multiple studies both shared that competency-based education is not just a change in grading, but a complete change to teaching and learning (Philhower, 2017; Shakman et al., 2018; Toland, 2017). Overwhelmingly, across studies, teachers described their primary role as less of a teacher and more as a coach or facilitator. (Philhower, 2017; Sullivan & Downey, 2015; Sullivan, 2016; Toland, 2017). Toland's (2017) and Carlyle's (2018) studies stress the importance of dialogue between students and teachers for building relationships to support students. Also, because competency-based education gives students greater autonomy, Basham et al. (2016) and Shakman et al. (2018) indicate teachers found the need to directly teach social and emotional skills such as self-regulation and self-management. In Philhower's (2017) case study, teachers reported they weren't just teaching content, but were teaching students how to be successful as

well. They focused more on building relationships with students, and one teacher reported that the new teaching role had a *spirit of entrepreneurship*.

Collaboration amongst teachers was identified as a significant factor of success in multiple case studies (Basham et al., 2016; Philhower, 2017; Toland, 2017). In many competency-based schools, working with other teachers was no longer an option and was considered a necessity, especially for calibrating what constituted proficiency for an objective (Philhower, 2017; Toland, 2017). In Basham et al.'s (2016) study, teachers were frequently observed during free periods collaborating to solve an issue with a group of learners and innovating on curriculum, instruction, or assessment. Conversely, schools studied by Gross & DeArmond (2018) that lacked fidelity also had low amounts of collaboration amongst colleagues. Schools with an existing collaborative culture are well positioned to be early innovators in competency-based education (Evans et al., 2019; Gross & DeArmond, 2018).

Despite many positive descriptors of an evolving teaching role and the benefits of collaboration, an overwhelming pattern across the research was the heavy workload and stress teachers experienced in competency-based schools. In Carlyle's (2018) phenomenology of middle school teachers, teachers commented that transitioning to more personalized practices required an incredible amount of upfront work which was daunting, time consuming, and exasperating. In Shakman and colleague's study (2018), many educators were largely still working to develop sound proficiencies and had not been able to give adequate attention to shifting their practice towards innovative curriculum and instruction. Bingham and colleagues (2018) found that teachers' workload had increased and that they were always changing their curriculum and instruction to figure out how to best employ personalized learning. Teachers interviewed from both Philhower's (2017) and Shakman and colleagues' (2018) studies had

commented that they felt like first-year teachers again. Lastly, Sullivan and Downey (2015) reveal that, for the school they studied, teachers had a lack of time to develop materials and resources before switching to a competency-based system; these teachers reported exhaustion, many putting in time during the summer or outside of school to complete work.

Interestingly, despite the high levels of work and stress, a significant portion of teachers in the cases reviewed passionately supported the work of competency-based education. In the large multisite case study by Gross & DeArmond (2018), despite finding low fidelity amongst the schools the study examined, many teachers and administrators believed strongly in personalized learning because they expressed it was effective, more organic, and they enjoyed the teaching process more. In Philhower's (2017) multisite case study, despite admitting the difficulty in implementing competency-based education, many teachers interviewed said that going back to the traditional structure would be going in the wrong direction, realizing that it cannot meet the needs of all students. A quote from a teacher in the case study by Sullivan and Downey (2015) highlights how teachers internally wrestled with the workload:

> Time is taken away from my family, but you're much more committed to it, you have drunken the Kool Aid, and I believe in it. With every bit of myself I believe in this. (Sullivan & Downey, 2015, p. 14).

This statement encompasses the consistent finding across studies that teachers were overwhelmed but dedicated to the aims competency-based education intends to realize.

Supporting Classroom Practice. As the 1st generation competency-based schools undergo implementation, models are beginning to form around professional development, learning frameworks, and day-to-day practice.

There is a critical need for targeted professional development practices that align with the needs of competency-based education (Bingham et al., 2018; Gross & DeArmond, 2018; Shakman et al., 2018; Toland, 2017). Casey (2018) argues for viewing teaching as a learner-centered profession. She contends that teachers cannot effectively work within a competency-based model by experiencing professional development through a traditional model. Just as a competency-based model should make objectives clear, encourage agency, and guide learners towards competencies, professional development for teachers should be no different. Providing an example of this mode of professional development, Kettle Moraine High School, a competency-based school in Wisconsin, offers its teachers an array micro-credentials to choose from to improve in specific areas of their practice. Additionally Southern New Hampshire University recently introduced *Master's (M.Ed.) in Learning and Leading in a Competency-Based Environment program* in which teachers experience competency-based learning themselves to earn the degree (Casey, 2018).

No one has competency-based education *figured out* (Casey & Sturgis, 2018), and exemplar models are greatly needed (Bingham et al., 2018; Shakman et al., 2018). In many of the case studies reviewed, teachers asserted the need to see tangible examples of how competency-based education can be realized within the classroom, and, without these models, teachers were frustrated with having to create materials and resources from scratch (Bingham et al., 2018; Gross & DeArmond, 2018; Shakman et al., 2018). One framework for how competency-based education can be executed in practice comes from Basham et al.'s (2016) mixed methods study seeking to qualitatively operationalize a framework for competency-based learning. First personalized instruction requires designing environments, systems, and a culture that supports self-regulation. From clear learning objectives, learners make weekly academic and

social and emotional learning goals, develop a plan of action, execute, and self-regulate on their progress. Second, data on student learning is readily visible for teachers and students posted on a wall or electronically in a school's *learning management system* (LMS). Data can include self-reports, teacher observations, or student performance on formative assessment. Third, from this data, most useful being academic progress and student effort, teachers and students make actionable decisions on how to move forward. Fourth, continual feedback with this data occurs in instruction or during weekly meetings or conferencing. Conferencing was highlighted as an important opportunity to establish meaningful student-teacher relationships to support student belonging, motivation, and progress (Carlyle, 2018; Sullivan, 2016; Toland, 2017). Fifth, learners are encouraged to use their data to make their own decisions on how they might execute different learning strategies or employ different social and emotional strategies to succeed. Sixth and last, learners can decide to demonstrate learning in multiple ways. Basham and colleagues note the difficulty in teachers developing these multiple options at the school under study, but also emphasize the observed higher levels of engagement and more authentic, meaningful learning that arose from this choice. (Basham, 2016)

In addition to Basham's model, in an extensive briefing report examining how to best meet students where they are, Rudenstine and colleagues (2018) present a framework on how teachers may direct student learning during a class period. For a day of learning, teachers first set up the learning environment (classroom, materials, resources) in a way that allows for differentiated tasks and learning modes. Second, using actionable data from an LMS or the warm-up that day, student groups are planned in accordance with where they are in developing mastery. Third, teachers can employ a multitude of learner-centered activities such as discovery-based mini lessons, explicit teaching of skills and strategies, student conferences, discussions,

etc. that students can engage in and even choose based on self-assessing their own learning needs. Although the self-directed nature of the above model may appear ambitious because it contrasts with the standard approach of the teacher giving students tasks, this teaching framework is also designed for, and has already been implemented at, competency-based schools at the elementary level. (Rudenstine et al., 2018) Both Basham and Rudenstine provide an initial framework on how to potentially facilitate student learning in a competency-based model, but further implementation and research to illuminate and refine best practices is required moving forward.

Summary of Review of Literature

This chapter provided context around competency-based education and a review of literature on current implementation efforts. Competency-based education is built upon the learning theory that all students can learn if given the time and support, and the motivational theory that students will engage themselves in tasks where they experience mastery, have autonomy, and perceive purpose and relatedness in their environment. In competency-based education, rather than progressing based on seat time, students' progress is based on proficiency. In lieu of faulty grading practices, learning is measured by proficiency. Narrow academic outcomes are replaced by authentic knowledge and skills. And alternative to compliance, students are empowered to practice agency. Multiple times in the past century, competency-based education has arisen as a promising potential model but has been short-lived due to lack of resources, coordination, and the sheer difficulty to budge traditional structures such as the Carnegie unit and graded classroom. In the past decade, competency-based education has made a recent resurgence, but, with signs of history repeating itself such as in Maine (Shakman et al., 2018), it is critical to evaluate the implementation of 1st generation competency-based schools.

Examining the current research on competency-based education, a small number of quantitative studies show potential promise in achievement, and in many other instances it is difficult to determine the effects of achievement due to lack of fidelity. Thus, qualitative studies were largely reviewed to gather greater insight on implementation. Concerning student experience, at competency-based schools there are reports of a greater emphasis on learning, student engagement and ownership of learning, as well positive culture shifts. Self-pacing for students is noted as a factor of success, but many schools experienced considerable challenges supporting self-pacing and providing rapid and differentiated support. Related to this, advisories do appear to be a potential structure for fostering community, self-regulation, and other social and emotional skills. In addition, many case studies indicated teachers' roles changed to that of facilitator and collaboration appeared to be frequent and necessary among colleagues. At almost every school, teachers reported to be overwhelmed with the workload, but these teachers believed that competency-based education was right for students. Lastly, models have begun to emerge around competency-based education related to professional development, operationalization, and daily classroom methods. Yet, additional tangible models and examples are greatly needed. Informed by this literature review, this study seeks to further explore the implementation of competency-based education in secondary schools.

Chapter III: Methodology

This chapter outlines the methodology and the methods of data collection and analysis in this study based on the research questions exploring competencies at The Core Project and the two high schools it partners with. First, I present the rationale for employing a qualitative research methodology, specifically utilizing a case study approach and readdress the research questions. I then provide context for how the COVID-19 pandemic affected the research design of this study. Next, I describe the specific methods used in the study for data collection and data analysis. Lastly, I discuss the trustworthiness of the methods, explain my positionality, and consider limitations to the methodology and methods.

Rationale and Research Approach

This is the first study known to specifically investigate competency-based schools that use skill-based, transdisciplinary competencies and aims to form a comprehensive picture of how these competencies are implemented and influence teacher practice. Thus, a qualitative methodology lends itself to this research because the researcher is present and interacting with the setting, and can draw upon multiple sources of data to provide a deep understanding to complex and nuanced issues (Creswell & Poth, 2018).

Within the umbrella of qualitative research, this study specifically employs a case study research methodology. In a case study, the researcher chooses the bounded system of what is to be studied within a particular time and place (Creswell & Poth, 2018). Thomas (2015) states that "your case study is defined not so much by the methods you are using to do the study, but the edges you put around the case" (Thomas, 2015, p. 21). In this study, the edges – the phenomenon of interest – are the implementation and teacher practice with competencies at two high schools that are part of the same competency-based organization. A case study is a useful method of

research when seeking to understand a real-life phenomenon in depth within a very specific context. The benefits of an in-depth understanding around a specific context do present the disadvantage of an inability to generalize in a deductive manner. However, insights can still be transferred and applied to separate contexts. Readers can vicariously experience the researcher's rich narrative descriptions that generate a picture of "teaching…[that] can become a prototype that can be used in the education of teachers or for the appraisal of teaching" (Eisner, 2017, p. 171). Further, it is not the researcher that determines further applicability, but the reader that makes meaning from the case study and evaluates how the findings of the case study might apply to their own context of interest.

A case study allows for a large array of data collection methods (Yin, 2017). Well-performed case studies employ a variety of data sources to form accurate case descriptions including: observations, interviews, artifacts, and even quantitative data (Creswell & Poth, 2018; S. M. Ravitch & Carl, 2015). One of the most important sources of data is the interview because of the richness of data it offers and because the researcher can adapt questions to explore new facets of the phenomenon that organically arise (Yin, 2017). Throughout and after data collection, the data are analyzed to form case descriptions identifying main themes, and the researcher concludes with assertions or general lessons learned (Creswell & Poth, 2018).

Research Questions

This case study explored two high schools partnered with the same organization with the pseudonym The Core Project. With the guidance of The Core Project, these schools used transdisciplinary, skill-based competencies. The purpose of this case study was to examine how competencies at these schools were implemented, how they influence teacher practice, and to

identify challenges related to competencies as well as the competency-based system in general. The research questions were as follows:

1. How are competencies employed?
2. How do competencies influence teacher practice?
3. What are challenges experienced related to the competencies and the competency-based model in general?

Circumstances Related to COVID-19 Pandemic

This research took place during the COVID-19 pandemic and how these circumstances influenced the research is worth noting. The original research design intended to be a three-day, in-person site visit to a physical research site that would have included, in addition to the interviews and artifacts that were still present in this study, classroom observations and student focus group interviews. Soon after establishing initial contact with The Core Project leader in February of 2020, the COVID-19 pandemic began and remote learning replaced in-person learning in schools. Thus, the methods of this study were redesigned in light of the limitations presented by the COVID-19 pandemic. Despite this change, the new methods provided their own particular advantages that allowed for comprehensive insight into the research questions. These specific advantages will be described further in the limitations section.

Although the data collection took place during the summer of 2020 during the COVID-19 pandemic, the research in this study does not explore teaching and the use of the competencies during the pandemic or remote learning. The pandemic has changed society and education, and research related to education during this time is valuable; however, this study aimed to explore competency-based education for the purpose of informing further research and implementation in the in-person context that would eventually return. Therefore, during interviews I

acknowledged the circumstances of the pandemic, but asked teachers to share their teaching experiences with competencies during in-person learning. Thus, this research pertains to the implementation of competencies and the experience of teachers using competencies only during in-person learning.

Selection Process

School

Leaders and authors in the competency-based field were contacted and were asked if they could recommend any competency-based schools that meet all of the delimitations below.

1. The school uses proficiencies that are competencies (not standards). Competencies need to be skill-based and are preferably transdisciplinary.
2. Although students may take traditional paper and pen assessments, competencies are accomplished through more authentic demonstrations of knowledge.
3. Students advance upon mastery. Alternative methods of reporting mastery to traditional grades of A, B, C, D, F are preferred.
4. The school has some type of differentiated support system to respond to students that have not met mastery.

From these recommendations, artifacts from these potential sites such as the school websites as well as online articles were viewed to confirm the above criteria were present. The final research site was chosen based on the author's evaluation of the richness of the competencies, the extent to which authenticity was encouraged, and an overall perceived adherence to a competency-based model. In addition, to address the potential argument that new, innovative educational models such as competency-based education cannot be achieved at scale in a *typical school*, public schools were prioritized in the selection process. From this process, an

organization named The Core Project and the two schools that it partners with to facilitate a competency-based education model were chosen as the phenomena under study.

Participants

Core Project Leaders. Once The Core Project was selected as a potential research site, a Core Project leader was contacted via an email introduction facilitated by a mutually-known person within the competency-based field. The Core Project leader became the point of contact for assisting communication amongst other participants and also fielded many emails, provided an array of artifacts, and participated in interviews. The Core Project leader established communication with the principals of two schools partnered with the Core Project to gain permission to use their schools as a research site (See *Appendix A – Letter of Support).* The principals were also asked to participate in the study but did not respond. In addition to the Core Project leader described above, a second Core Project leader also agreed to participate in this study, and engaged in interviews and provided artifacts.

Teachers. Teachers of core courses (math, English, social studies, and science) at both schools were recruited to be part of this study with the help of the Core Project leader who served as the point of contact. The Core Project leader connected interested teachers with me via email which included a one-minute introductory video about the study and a link to a Google form. The Google form included the information sheet to provide participant consent to the study as well as to indicate particular information and availability related to participation in the study. (See the following appendices: *Appendix B - Email to Teacher*; *Appendix C – Video to Teacher* (Script); *Appendix D – Participant Google Form*; *Appendix E - Participant Information Sheet*)

Data Collection

Interviews

One-on-one, semi-structured interviews were completed with Core Project leaders and teachers. Interviews were conducted via the video application *Zoom*, and lasted for about an hour. (See *Appendix B – Teacher Interview Protocol)*. The success of an interview depends on the interaction between both the interviewer and the interviewee. Ideally, an interview should have the dynamics similar to a conversation of mutual give-and-take as Fontana and Frey (1994) argue such interviews are more honest, morally sound, and reliable. Although an argument could be made that I may be biased, the interviews conducted in this study highly exemplified this rich, authentic dialogue. In total 14 interviews were conducted with the different types of educators below:

Table 3.1. Participants and Interviews

Educator	**Interviews**
Science teacher 1	1
Science teacher 2	1
Social studies teacher 1	2
Social studies teacher 2	2
Math teacher 1	2
Math teacher 2	2
English teacher 1	1
Core Project leader 1	2
Core Project leader 2	1
TOTAL	**14**

Artifacts

Artifacts were obtained to provide added context and knowledge for addressing the research questions of the study. Extant artifacts, including the school website, public reports and records, school handbooks, and news articles, were first explored to prepare for interviews. Elicited artifacts, artifacts that involve research participants in producing the data (Creswell & Poth, 2018), including assignments, student work, and instructional materials, were also obtained. These elicited documents were requested toward the end of interviews after more of a rapport had developed between myself and participants.

Data Analysis

In qualitative research, data analysis occurs in tandem with data collection (Bailey, 2018; Creswell & Poth, 2018; S. M. Ravitch & Carl, 2015). As data was collected, I precoded the data (S. M. Ravitch & Carl, 2015) and wrote memos. For instance, shortly after interviews had taken place, I manually transcribed the audio recording which provided the time and opportunity to make preliminary codes and reflect. After transcribing, I would write memos to summarize findings, record current thoughts, and practice reflexivity.

With a foundation of initial precoding, upon completion of data collection I engaged in formal data analysis. On a *Google* doc, a preliminary list of codes or potential themes had been generated from precoding. As I read through the transcripts, I copied and pasted quotes that supported a particular code or theme. Text from interviews and observations was colored in a word processing application to easily keep track of the source of the data being analyzed and aid in triangulation. For example, different text colors were used for teachers of different disciplines and for school leaders, and different shades of the same text color were used for teachers within the same discipline. As I read through the transcripts, I copied and pasted quotes that supported a

particular code or theme. Notes on, or links, to artifacts were also added as support to these codes and developing themes. This process was iterative as new codes were created and previous codes were revised or merged, based on insights concerning how well the data fit emerging themes.

In qualitative data analysis, the researcher goes through the process of deeply engaging in the data, putting current themes to the test by providing enough evidence of themes from multiple sources (S. M. Ravitch & Carl, 2015). Looking through the data analysis document, I was able to examine the quantity of quotes that supported a specific code and emerging theme. In addition, having color codes facilitated triangulation as a diversity of text colors revealed that a theme was supported by multiple educators and sources of data. Lastly, although these methods were helpful in identifying patterns and initial themes, not every source of data holds the same amount of weight. It was necessary to critically evaluate how well and to what extent each piece of data supported a theme (Bailey, 2018).

Trustworthiness

Trustworthiness of a study in qualitative research is commonly characterized by Lincoln and Guba (2018) as having credibility (similar to internal validation in quantitative research), transferability (external validation), dependability (reliability), and confirmability (objectivity).

Credible results presented by the researcher are believable, authentic, and plausible (Bailey, 2018). Credibility was pursued in this study through establishing rapport, triangulation, reporting negative evidence, and member checking. Rapport was developed with participants through introductory conversation during interviews, sharing my own experience as a teacher, and engaging in discussion not just as a researcher but also as a teacher looking to improve his practice. Rapport allows for the participants to more comfortably share their experiences and thoughts, increasing the likelihood of truthful responses (Fontana & Frey, 1994). Next, the

themes in the findings were triangulated using artifacts, and a relatively large array of interviews from nine different educators were conducted (Creswell & Poth, 2018). Another practice to further credibility, negative analysis, was used which involves acknowledging that not all data will agree with a pattern or code (Creswell & Poth, 2018). Despite a theme having strong supporting evidence, instances where data did not fit the findings were grouped during data analysis and acknowledged in the findings. Lastly, especially because COVID-19 prevented observations as a mode of data collection, the vignette that introduces my findings was member checked (Bailey, 2018; S. M. Ravitch & Carl, 2015) by the teacher that it had been inspired by.

Confirmability involves the understanding that although qualitative research is inherently subjective, deliberate actions should be made to remain neutral and reduce bias. First, I strove to practice reflexivity when writing memos to continually engage in the process of reflecting on how my biases might be influencing the research. I explicitly discuss these biases in the next section. Next, triangulation not only contributed to credibility, but also to confirmability, because having multiple data sources point to the same theme keeps the researcher's interpretation more grounded in the data.

Transferability in qualitative research is many times compared to generalizability in quantitative research. However, a case study, by its very nature, intends to examine the case at hand without making large generalizations (Yin, 2017). Transferability thus refers to methods that best allow for readers to evaluate how and to what extent the information presented in a study might best be applied to inform other educational initiatives and further research in different settings. To this end, contextual and demographic information were provided in the research setting and context section, and the findings included rich descriptions. Further,

delimitations of the study included only public schools to help provide the most relevance for the majority of educators in the U.S.

Positionality

The researcher is the primary instrument in qualitative research and inevitably brings values and epistemologies that effect the data collected and how it is interpreted (S. M. Ravitch & Carl, 2015). Wolcott (2010) states:

> Our readers have a right to know about us…they want to know what prompts our interest in the topics we investigate, to whom we are reporting, and what we personally stand to gain from our study. (Wolcott, 2010, p. 26)

Not only does the researcher's positionality provide context for the reader, it also aids in confirmability through the process of reflexivity. That is, the researcher has explicitly gone through the process of identifying his biases and can refer back to his positionality while continuing to engage in his reflexive journal during data collection and analysis. Below, I present how I position myself in the research study.

My views on education have been strongly influenced by my personal experience and my career in education. In high school, I was intrinsically motivated to pursue my own projects outside of school, and the joy I experienced, and the knowledge and self-efficacy I gained from such experiences, motivated me to develop similar learning experiences for others. With these values in mind, it is important to recognize how one of my theoretical frameworks, self-determination theory, although supported by extensive psychological research, aligns with my core values and heavily my shapes my philosophy of education and teaching.

While pursuing my first master's degree, I researched character or non-cognitive factors (closely related to social and emotional learning), creativity, and intrinsic motivation on learning

and life outcomes. This research led me to pilot a voluntary independent learning experience (that I named *The Core Project*) at a local high school as part of an independent study, and to also implement *Genius Hour*[1] every Friday during my student teaching. Although there were benefits to these learning environments, significant obstacles and setbacks arose in both that highlighted the need for extensive supports to guide students in the skills needed for independent learning. Lastly, at the same time, my work in developing science curriculum for an organization called Project NEURON confirmed my belief that students can construct their own understanding of a phenomenon provided the right supports.

I am now in my 8th year as a high school science teacher. When I began my career, I realized how content-heavy the traditional general high school science curriculum was and how little scientific skills were explicitly taught and assessed. Further, I gained first-hand experience on how the traditional structures Tyack (1994) calls the *grammar of schooling* can discourage students and move them down the *assembly line* without truly reaching mastery. Fortunately, I am part of two professional learning communities (PLCs) for the physics and biology classes I teach that have recognized these problems, and we have worked to pioneer a new proficiency-based grading curriculum designed to value skills and provide students with multiple opportunities to show mastery and growth. Although progress has been made in the classes I teach, dissonance still exists between my classes and a learning environment that is truly learner driven and allows for authentic application of knowledge and skills.

Early in my doctoral studies I explicitly defined my ultimate goal for my work in education: I am determined to develop learning environments that (1) empower students and (2) ensure that all students can find success. Continuing with the questions that remained after my

[1] Genius Hour is a concept and movement where students are typically given a class period each week to engage in a learning or project that they are intrinsically interested in and passionate about.

first masters, I wanted to explore how to provide students with the skills to drive their own learning. I began researching social and emotional learning where I was soon led to the broader realm of competency-based education, which became the focus of my doctoral work. Although I cannot deny bias towards favoring competency-based education, again my ultimate bias is in how well any learning environment (1) empowers students to pursue goals and tasks, and (2) allows all students to succeed. Thus, aided by my critical and scientific mindset, I am resolute to put any learning environment, including competency-based education, under strict scrutiny.

Limitations

Limitations are present in any research study, are factors outside of the researcher's control, and can deter from the accuracy of the findings. For instance, although explicit actions were taken to increase trustworthiness, data collection and analysis are ultimately limited by researcher subjectivity (Bloomberg & Volpe, 2019).

Another limitation of this study involves the absence of observations as a method of data collection present in many case studies. Before the COVID-19 pandemic, this study was intended to take place at one or both Core Project schools over a period of about three days and would have included observations. Thus, the richness of data that one gains from being physically immersed in the environment under study was not possible. Also, themes that emerged from interviews and artifacts could not be further corroborated with observations. However, it should be noted that conducting data collection via *Zoom* during the summer also had its advantages over a three-day visit to a research site. Teachers had greater availability, were likely less stressed, and, with a larger window of time, a larger number of and more in-depth interviews could be conducted. Also, with more time, data analysis could be more

intertwined with data collection as precoding and memos could inform questions for upcoming interviews.

An additional limitation of this study involves the selection of participants. The teachers for this study were first contacted and selected by the point-of-contact Core Project leader. The teachers that were selected overall embraced the Core Project model and employed it with a relatively high degree of fidelity. However, it was apparent that there were other teachers that struggled with these two aspects. Thus, although the selection of participants afforded rich conversations and data around competencies, perspectives from teachers with different views and experiences in teaching with the competencies were not present in the data.

Summary of Methodology

A case study was conducted to best examine how competencies are implemented at the Core Project schools, how they influence teacher beliefs and practice, and to identify particular challenges in implementation. Research was conducted during the COVID-19 pandemic, but still focused on implementation and teacher experience during in-person learning for the purpose of relating to and informing this type of learning after the pandemic. Schools that employ skill-based competencies were selected along multiple delimitations related to their fidelity to skill-based, transdisciplinary competencies and competency-based education. From this, an organization with the pseudonym *The Core Project*, and two of the high schools it partners with, were selected as the phenomenon of interest for this case study. A Core Project leader acted as the point of contact to gain research approval by the school principals and to initiate contact with teachers. The Core Project leader also engaged in the research as a participant.

Data collection methods included collecting artifacts and conducting interviews with teachers of core courses (math, science, English, history) as well as with Core Project leaders.

Data analysis began with data collection through precoding and reflective memos. After data collection was completed formal data analysis began with supporting initial pre-coded themes generated in a *Google* doc with color-coded quotations from transcripts and links to artifacts. Through this process themes were deleted, added, or consolidated, and revised to generate the final themes.

Concerning trustworthiness, credibility was pursued through establishing rapport, triangulation, reporting negative evidence, and member checking. Practices to gain confirmability, that is neutrality in data analysis, included triangulation and engaging in reflexivity through frequent memos. To promote the ease of transferability this case study deliberately examined public schools. Further, rich descriptions along with contextual and demographic information were provided in the findings. In this chapter, I also shared my positionality to more honestly acknowledge potential bias as the *device of measurement (Creswell & Poth, 2018)*. Lastly, limitations in this study involve the subjective nature of qualitative case-study research, the reduction of data collection methods due to the COVID-19 pandemic, and narrowed participant selection.

The next chapter provides an overview of the research findings that emerged from the data analysis.

Chapter IV: Findings

Introduction

This chapter presents the findings that emerged during the case study data analysis of The Core Project and the two schools that it partners with, Hill Valley High School and Hawkins High School. Research was conducted to investigate how competencies are implemented, how competencies influence teacher practice, and challenges in implementation. The findings are separated into five sections. In the first section, a vignette is presented to provide the reader with a rich description of how competencies are intended to be employed at the Core Project schools. In the second section, the research setting and context is described. In the third section, the research question, *How are the competencies employed?* is addressed and examines, (1) the competency model, (2) school structures, (3) the learning model, and (4) scaffolds for agency. The third section addresses the research question, *How do competencies influence teacher practice?,* and presents four main themes: (1) the dynamic competencies generate around content and project-based learning, (2) the influence of competencies on teacher practice, first pertaining to mindsets and other general themes, and then on (3) classroom instruction, and finally examines (4) teacher professional development around using competencies. The fourth section addresses the research question, *What are the challenges experienced related to competencies and the competency-based model in general?* and identifies three challenges: (1) fidelity, (2) mismatch between competencies and state mandates, and (3) communication with students and parents.

Case Study Vignette

The following Vignette is primarily inspired by the interviews and artifacts from participant Social Studies Teacher 2, and is also built upon the culmination of the data collected

for this study. Due to inability to conduct particular modes of data collection, this vignette is not based on observation; rather, it is an approach to analyzing and synthesizing the data from interviews and artifacts in narrative form. Because observations were not part of this case study, the following Vignette was member checked by Social Studies Teacher 2. Part of her response included the following:

> It is a very idealized version of what we aspire to do. In a perfect implementation, this is certainly what I would wish for my classroom to look like. If this is the intention, then I say well done.

Indeed, this is the intention of the vignette below. Competency-based education is a difficult model to implement because it is a vastly different paradigm of viewing education compared to traditional education. As a result, innovative models are greatly needed (Evans et al., 2019; Reif et al., 2015; S. C. Sullivan, 2016; Toland, 2017). Thus, the purpose of the vignette is to provide a vicarious experience, a tangible example, of an alternative way of imagining learning in public education. The reader should reader remember that this vignette is an idealized account. In the preceding three sections, the learning model, teacher beliefs and practices, and implementation challenges will be presented to more realistically ground the reader in where the Core Project schools currently stand on their journey towards implementing competency-based education.

Vignette: Mrs. Leavitt's Class

Touring Hill Valley High School, you walk into a classroom to see the teacher, Mrs. Leavitt, introducing a new unit. Leavitt poses the enduring question to the students, "How do citizens make change in their communities? Civic participation and your civic voice starts now!" Mrs. Leavitt then makes a video call and a group of college students, part of an activism club at a

local college appear on the other end eager to discuss their organization and field questions from students. Once the discussion with students and the activism club ends, Mrs. Leavitt ends the class by asking the students, "What is an issue that you care about? In this unit, you will choose an issue that is important to you and develop an action plan to contribute and advocate for this issue."

The class ends, but you have questions for Mrs. Leavitt. Stopping by the social studies office during a later period, you notice the entire social studies department is in the office. A group of teachers, including Mrs. Leavitt, are gathered around a table looking at an argument written by a student and are continually referencing what seems to be like a rubric on another teacher's laptop. "Yes, I agree with you," Mrs. Leavitt says to the other teacher while pointing to the rubric. "Your student develops several logical reasons directly supporting their claim. That would be a Level 10. *But*, their ability to refute or disprove their counterclaim has only met the indicator of a Level 8."

After a few minutes, the teacher's collaborative norming session ends and you have a few moments to chat with Mrs. Leavitt. From the class just observed, you are curious about how the students will develop their action plan and what the unit will look like. "The first few days of the studio, what we call units, is all about the *Launch*," she says. "We will continue to peak students' interest, develop individual relevance, and build background knowledge, by showing, reading, and discussing other examples of civic action. For instance, tomorrow the students will be reading an article, watching an interview, and having a discussion about Malala Yousafzai, the young female activist and Nobel laureate."

"What will the students' action plan look like?", you ask.

"Well," Mrs. Leavitt answers, "I looked at our competencies – the skills we teach at Hill Valley High. To execute an effective action plan, from the competencies we use here, I determined the students need to have the skill set of analyzing historical events, engaging as a citizen, engaging in collaborative discussion, conducting research, argumentative writing, networking, giving a presentation, and ensuring project quality."

"You mentioned writing arguments," you say. "Is that what you and your colleagues were discussing earlier?"

"Yes, it was!", Mrs. Leavitt answers. "Students are assessed on how well they are able to perform on those competencies – the skills I just mentioned. We assess them across this thing called a continuum. So, you saw my colleagues and I discussing the continuum for argumentative writing."

"A continuum?" you ask.

"Yeah, so for example, you can support a claim in kindergarten and you can support a claim in high school. You're doing the same skill, but clearly with a different level of rigor. The continuum describes what the same skills looks like at different levels. So, with our continuum, we have a clear description of what supporting a claim looks like at a middle school level, early high school level, late high school level, and a college level. Although, we don't label them like that. But that's a whole different story."

"What about history, what about the content?" you ask. "It's a history class. Don't they need to know events?"

Mrs. Leavitt immediately responds, "Absolutely! After the *Launch* phase, in our *Investigation* phase, through the competencies, students will need to learn the function of government at the local, state, and national level, perspectives on the nature of the social

contract, and investigate the historical evolution of both strategies and perspectives that relate to their chosen issue." Intrigued about how this studio will play out, you ask if you might be able to come back in a few weeks to observe Mrs. Leavitt's class again. She happily agrees.

Two weeks later you walk into Mrs. Leavitt's classroom and see students in different groups. Students are not just in smaller groups, but each group is completing a different task. One group is on laptops working together. A second group seems to be working with documents at a table. You notice that a few other students are working individually. At this moment, Mrs. Leavitt happens to be at the far end of the classroom fielding questions from a group of students. As you walk towards this part of the classroom to hear their conversation, you notice one of the whiteboards reads "*Competency: ELA7 Conducting Research. Today's Skill: ELA 7.3 Using system to gather and organize information*." While walking over towards Mrs. Leavitt you can't help but notice the group nearest you and ask one of the students what she is working on.

"I'm working towards a Level 12 in Conducting Research" the student responds. "Last year I earned a level 10 and was able to organize my research on Google Drive. I'm still using this framework, but I'm now showing I can maintain my research journal on my own and I've added this footer that allows me to record my thoughts and reflections while adding to my *Google* Doc."

Thanking the student for the explanation, you continue to make your way to the group Mrs. Leavitt is working with. This group is also working on the same competency of Conducting Research, but you learn these students, instead of a Level 12, are working towards a Level 8 together. Mrs. Leavitt has provided them with a notetaking template on Google Drive and is coaching them on distinguishing between indicating direct quotation, paraphrasing, and their personal thoughts by using color codes.

Halfway through the lesson, Mrs. Leavitt looks at her notebook and then calls five students over to join her at another table. She says to them, "I want to give you an extra opportunity to work on the competency of *Analyzing Historical Events* since you all had earned a Level 8 in our last studio." She adds further direction, and the newly formed group begins to tackle their new task to progress towards a Level 10, while Mrs. Leavitt continues to circulate the classroom coaching different groups on their particular undertakings.

Touching base with Mrs. Leavitt a few weeks later, she is excited for the students to complete their action plan in a couple weeks. "They have actually just completed their first drafts of their action plans," she says.

"Will you grade those?", you ask.

"Well, our continuum doesn't directly include letter grades. We determine performance levels. When you were in my class, you observed different students were aiming for different performance levels, right? Students in the class are all able to experience the same studio, but the continuum allows me to meet students where they are. So, getting back to your question, I will put their current performance level in the gradebook. *But*, a key part of our learning model is the revision process we are starting next week. Here, students will respond to feedback from their peers and myself, and use the continuum to see what actionable steps they need to take in order achieve their intended performance level on the continuum."

"Having students choose their own topic and work on developing particular skills to make an action plan seems very authentic," you respond.

Agreeing, Mrs. Leavitt says, "Yes, part of our mission is to assist students in developing agency. In fact, that is why the studio doesn't actually end with their performance task. There should be an impact experience too. So, for example, for our studio on civic action, in a couple

of weeks some students we will be leading an Action Fair attended by citizens, advocacy groups, and people from government to present on their issue. Also, as part of the networking competency, another student has chosen to do their impact experience during the unit and has been volunteering for a state representative's office to push for the issue she cares about. Two of my other students love making videos and decided to make a video that they will present to the school to spread awareness on their issue. The competencies are amazing at helping students gain skills, but we also want to ask - what do we really want to teach the kids? The important thing – the overall goal of The Core Project, of Hill Valley High Schools, is to give students the skills and empower them with agency to be independent learners and direct their lives."

Research Setting and Context

To address the research questions, this study examines the use of competencies at two high schools partnered with a nonprofit organization called The Core Project. The Core Project works to develop a model in education with the mission of "empowering networks of learners to connect with their passions and build agency to impact their world" (organization website). In addition to the two high schools that are the focus of this study, The Core Project partners with affiliate schools around the country that work to adopt its educational model, use its resources, and utilize its coaching and support. The Core Project has a vision for revolutionizing education, and skill-based, transdisciplinary competencies are an essential element of this model.

The two high schools that are the focus of this case study that partnered with The Core Project are Hawkins High School and Hill Valley High School. Hawkins High School is located in the city of Hawkins, a major city in the Eastern United States. Hill Valley High School is located in Hill Valley, another smaller city close to Hawkins. Demographic information on both schools is presented in Table 4.1 below.

Table 4.1. Demographic Information for Hawkins H.S. and Hill Valley H.S.

	Hill Valley High School	Hawkins High School
Student Population	480	334
Economically Disadvantaged	77 %	76 %
English Language Learners	11 %	5 %
Special Education	19 %	11 %
Percent enrollment by race/ethnicity		
Hispanic	72.5 %	13.8 %
Black	16.5 %	82.6 %
White	10 %	2.4 %
2 or more races	1 %	0.9 %
Asian	0.9 %	0 %

Hill Valley and Hawkins High School have been partnered with The Core Project for five years and six years respectively. Hill Valley started as a new school as result of a state representative working to find a partner to make an innovative public school, in response to charter schools diverting public education funds. Hawkins partnered with The Core Project as part of a citywide initiative to develop new educational models, particularly for schools that were low performing on state tests. Hill Valley and Hawkins, although working closely with The Core Project, are independent public high schools with teacher unions and a school board that vote to renew their partnership every two or three years. Although both schools are partnered with The Core Project, it appeared that Hill Valley's partnership is stronger in terms of their utilization of The Core Project competency-model, learning model, and resources compared to Hawkins.

Research Question #1: How are competencies implemented at the Core Project?

This section addresses the question, *How are competencies implemented?* and will explore its competency-based education model, school structures, and learning model.

Competency Model

The Competencies. For the Core Project, the competencies are essential skill-sets of post-secondary readiness; they are transferrable skills that are content agnostic and consist of many separate skills. Competencies are written in a way that students can only demonstrate mastery of them by applying their knowledge via performance tasks as opposed to paper-and-pen exams. For the Core Project, there are five categories of competencies. The category Core Content Areas includes the transferable academic skills students need to be college and career ready. Although these competencies can be and are used across any discipline, for logistical reasons early in implementation, the competencies are categorized inside what might be seen as their traditional subject domain. For instance, although *Argumentative Writing* is an English Language Arts (ELA) competency, it is regularly used by other disciplines such as social studies and sometimes science. The four other categories of competencies pertain to social and emotional skills and dispositions that are also deemed vital for college and career readiness. These include *Habits of Success*, *Wayfinding Experiences*, *NextGen Essentials*, and *Personal Development*. These categories are shown in Figure 4.1 below while Figure 4.2 provides an example of the competencies that are part of the science domain.

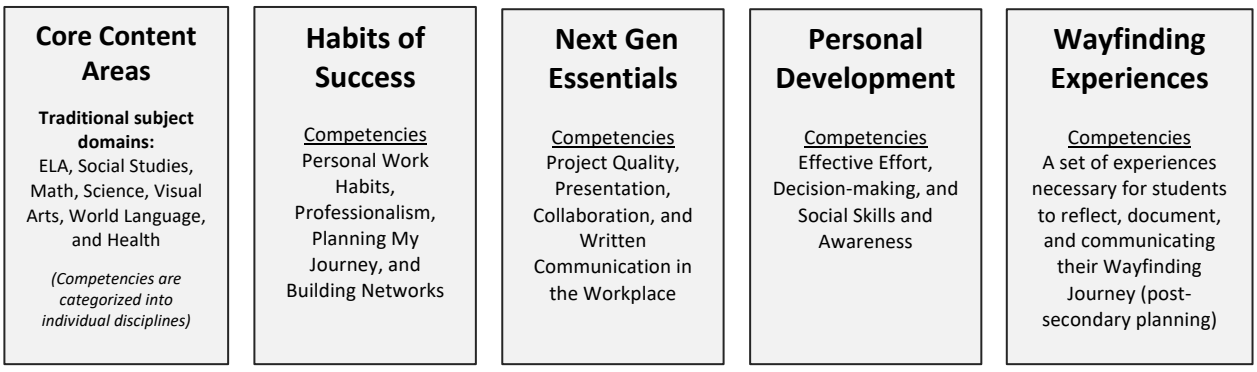

Figure 4. 1. The Competencies

The Science Competencies

- SCI.1 Leading Scientific Investigations
- SCI.2 Analyze & Interpret Data
- SCI.3 Develop and Use Models
- SCI.4 Technical Writing

Figure 4.2. The Science Competencies

The Continuum. Competencies involve multiple skills, each with a continuum of performance levels that increase in rigor. Thus, many times the competencies are also interchangeably referred to as *the continuum* or *continua*. By analyzing the rigor of work that students produce in dual credit classes, the Core Project determined that a performance level of 10 equates with *college readiness* and Level 12 work equates with *college level work*. The performance levels are not intended to equate with traditional age-based grade levels, although teachers and Core Project leaders admitted students do inevitably view them as such. Students earn a performance level by successfully demonstrating the indicators that describe that performance level. An 11-year-old can earn a level 12 if she can successfully perform the indicators that are part of that level. Conversely, a 17-year-old would be at a level 8 if those are the highest indicators she can currently perform. Figure 4.3 illustrates an example of the continuum for the competency: *Analyze and Interpret Data*.

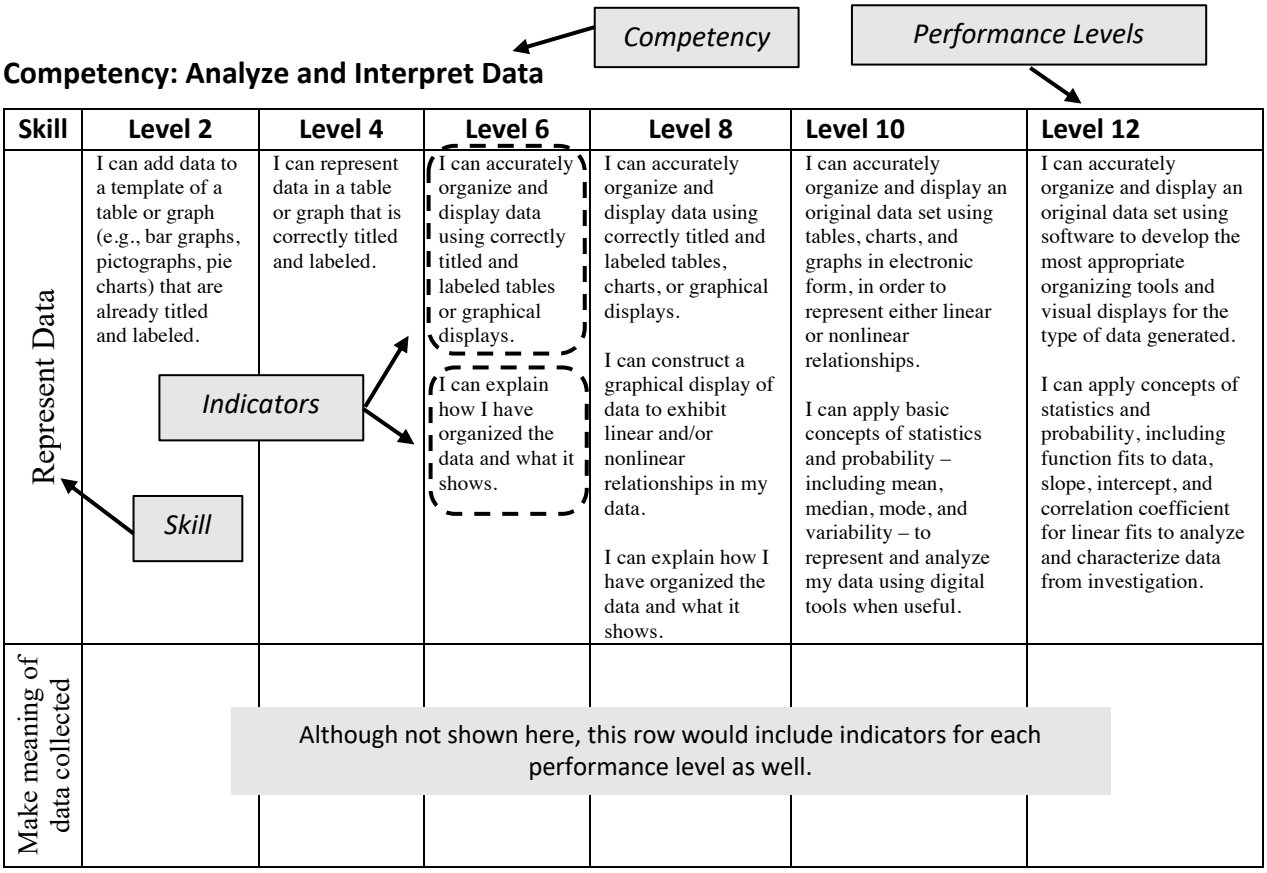

Figure 4.3. Continuum

Accomplishing Competencies. The competencies at Hill Valley serve, as both their graduation requirements[2] and their portrait of a graduate[3]. One Core Project leader stated, "We have a simple definition of competency-based education, which is changing our graduation requirements to require students to reach mastery." Students need to demonstrate a Level 10 proficiency (which equates with college and career readiness) in all competencies in order to

[2] Graduation requirements at Hill Valley are still technically credit-based, but these credits are synced with the competencies, so in effect, the graduation requirements are competency-based.

[3] A portrait of a graduate has been a recent and common initiative that many school districts have developed. A portrait of a graduate represents a school district's vision for the skills, dispositions, and mindsets intend to help students develop for success in their post-secondary endeavors and lives.

graduate. Hawkins, although utilizing the continua in assessment, used a more traditional grading system and thus had credit-based graduation requirements.

In The Core Project model, students progress academically and achieve graduation requirements by completing portfolios associated with each performance level. A Core Project leader likened portfolios to levels in a video game; and each level becomes more difficult as students progress. The Core Project believes that mastery is not just performance, but stamina. Thus, to achieve a portfolio a student is required to show mastery for that particular competency across multiple instances. A Core Project leader explained that stamina is important especially for students that will be attending post-secondary education and will be expected to employ these skills frequently. Figure 4.4 below provides a simplified example of a Hill Valley student's competency-dashboard that he would see while accessing the account on the school's *learning management system* (LMS). The competency-dashboard at Hill Valley is a *one-stop-shop* that allows students to see their proficiencies for all competencies. Notice in the figure how the example 11th year student can be accelerating ahead in one competency (*Analyzing and Interpreting Data*), on track in one competency (*Conducting Research*), and behind track in another competency (*Mathematical Problem Solving*).

Example Student, Year: Junior (11)

Competency	Level 8 Portfolio			Level 10 Portfolio			Level 12 Portfolio			
	1	2	3	1	2	3	1	2	3	4
Analyzing and Interpreting Data										
Conducting Research										
Mathematical Problem Solving										

Figure 4.4. Student Competency-Dashboard (Simplified)

For the Core Project, ideally traditional letter grades would not exist and instead *grades*, or student progress, would be communicated via the competency dashboard similar to Figure X above. Stakeholders would view the competency dashboard to view how students are progressing for their individualized intended goals. For instance, a student and her family that have the goal of graduating and potentially pursuing a trade school or a community college may view the competency dashboard and see how the student is on pace to reach the goal of demonstrating proficiency in college ready performance levels (Level 10 which is also the level for the graduation requirements). In another instance, a student and family who have the goal of gaining admission to a competitive engineering college may view the competency dashboard to see how the student is progressing towards reaching the target of demonstrating college level proficiency (Level 12) in particular competencies.

For reasons that will be expounded upon later, both schools currently have a hybrid system of tracking competencies and transforming this information into a letter-based grade. For instance, at Hill Valley teachers input student progress towards competencies in the competency dashboard, and this information is then pulled from the learning management system into a more traditional gradebook that displays both the students' progress in competencies as well as their projected letter grade. At Hawkins High School, the continuum was used as the scale to assess proficiency, but grades were converted and inputted in a more traditional manner. As of the writing of this study, Hawkins High School was on track to adopt a more competency-based learning-management system similar to Hill Valley.

In the past school year before this study was conducted, Hill Valley intended to give students the option to choose between having their progress communicated with the current hybrid grading system or pilot the adoption of a *Mastery Transcript* developed the *Mastery*

Transcript Consortium. The Mastery Transcript Consortium is a network of public and private schools that foregoes the traditional GPA and letter transcript for a model that more directly communicates specific skills and the degree of mastery for students. However, due to the COVID-19 pandemic, the use of the Mastery Transcript communicating student mastery was placed on hold.

School Structures

Schedule. Hill Valley and Hawkins both continue to use the framework of traditional schedules, but there is much more flexibility in their schedules than a typical school. There is a period in the day called *the wave,* which provides the time for teachers to help particular students or to give students the time to extend their proficiency on competencies. Moreover, the last few weeks at the end of the school year are highly personalized as students get additional opportunities to get higher ratings on particular competencies. Although a Core Project leader applauded how this personalized time period allowed for successful differentiation, it had also been an unduly burden on teachers.

A core tenet of competency-based education is that students receive rapid and differentiated support, which can happen at the classroom level but should also be present at the school-wide level. The flexible schedule developed by The Core Project schools has aided in this, but a Core Project leader admitted that system-wide differentiated support is still an area the organization and other pioneering competency-based schools struggle with.

Advisory. An advisory is vital to the Core Project model. A Core Project leader emphasized:

> The one piece we tell all schools to start with is to create an advisory program. To do this work, you're asking kids to do these authentic things. The best way to get them to engage

> in it…is to have good relationships with them. That's the foundation of all this work. If you don't have an advisory program, you won't be able to realize [competency-based education].

For advisory, the same group of students and the same advisory teacher meet at the beginning of each school day. Advisory serves multiple purposes, including (a) building relationships, (b) fostering non-academic competencies, and (c) overseeing students' holistic academic progress. Concerning building relationships, teachers beamed when talking about advisory and the word "family" came up consistently to describe the advisory environment. One teacher shared about advisory: "It's my family. Like those students are very attached to each other." Another teacher similarly communicated, "It's [about] letting the students build their own sense of pride in their advisory. It really does build that almost family type atmosphere."

Advisory is also where many of the Habits of Success competencies such as *Personal Work Habits*, *Professionalism*, and *Planning* are taught and assessed. "We do a lot of life skill things. We did resume building one day. We do real world stuff [as well]," explained one teacher.

Finally, advisory teachers have the role of helping oversee advisory students' whole academic progress. Advisory teachers coach students in managing their Personalized Learning Plans which are part of the school's LMS by aiding them in setting and working towards goals. One teacher explained, "I'm their parent almost, checking their grades and making sure everything is going well. And I communicate with the parents at least once a week." There is also a benefit of having developed a consistent mentor-student relationship over a student's entire high school career. "It allows the student, at least I hope, to feel like they have a champion in their corner," another teacher articulated.

Learning Model

Performance-Based Assessment. For the Core Project students are assessed through performance-based assessments – tasks that require students to do, make, or create, as opposed to taking *paper-and-pencil* tests. One of the Core Project leaders involved in writing the competencies explained that the teachers, "were very intentional with [creating] all of our continua that you can't assess [the competencies] without doing performance-based assessment." Performance tasks include labs, research reports, analytical papers, projects, oral or written presentation, and visual or performing arts. A teacher explained that she approaches designing studios and choosing performance tasks by asking herself and her colleagues the question: "How can you create opportunities for students to demonstrate learning [of the competencies]…within some kind of authentic context?".

Studios. Studios for the Core Project are what might be typically thought of as units. But instead of having a unit on a particular book or a particular piece of content, studios are initiated by framing authentic problems and ending with authentic impacts. A Core Project leader who was currently working with teachers from both high schools on summer professional development posed the question to communicate the goal of their work on studios:

> Rather than getting down to the granular level, how do we take on these bigger essential questions that we are exploring through the lens of social studies, ELA, [or any other discipline] to inform our ability to impact those situations for ourselves, for our community?

Thus, studios are designed for students to experience and apply their learning in some meaningful, relevant way in their community whether it be at the school, local, or even state and national level.

Teachers at The Core Project schools are given a great deal of autonomy, and a significant role for teachers is using their professional expertise to develop essential questions, and use backwards design to construct an engaging and effective studio. This teacher-driven approach aligns with one of The Core Projects core principles: *Teacher as designer. Student as designer*. Framed by enduring understandings and with an authentic impact experience in mind, teachers choose a performance task or tasks that will allow students to engage in a studio, and then select the competencies that these tasks require. With the competencies identified for a studio, the continua become a map for teaching. A Core Project leader elaborated:

> So, when people often ask, well how do teachers know how to teach kids [in this system]? Well, if you read the language of the continua, you can't get this rating if you're not teaching the skills. And so [the continua] is as much a tool to help teachers be better at teaching what students need to know and be able to do as it is to give students the information of what they need to know and be able to do.

Simply stated, teachers plan lessons within a studio by using the indicators in the continua as their learning targets.

Guiding the design of a studio is a consistent framework that consists of *Launch*, *Investigate, Create, Revise, and Impact.* (See Figure 4.5) Each studio begins with a *Launch* experience where a problem is posed to students to spark interest, motivate the *why* to the studio, and provide necessary background knowledge. From the vignette that began this chapter, the *Launch* included the class video-conferencing with a college activism club, and engaging in videos, articles, and discussion on the activist Malala Yousafzai. Next, the *Investigate* and *Create* phases engage students in developing a deep understanding of the content while developing proficiency in the competencies needed to complete the culminating performance

assessment. Important to the studio model is the revision process where teachers and peers provide feedback for students to revise their performance task. After at least one revision cycle, and sometimes more, a student produces one or more performance tasks whether it be a paper, presentation, video, etc. Teachers then use the continua to assess what performance level students have demonstrated on their performance task (i.e., Level 8, Level 10, Level 12, etc.).

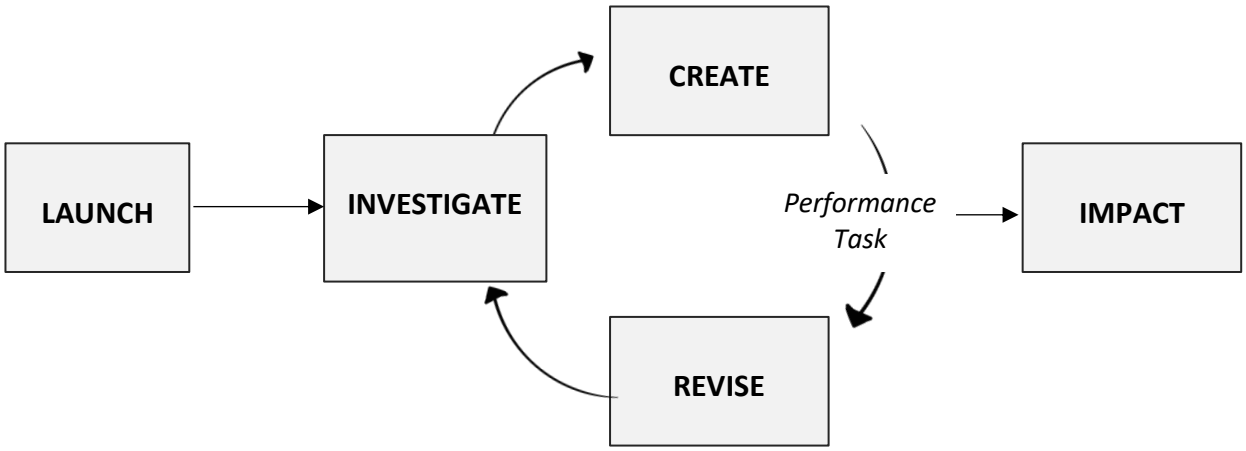

Figure 4.5. Studio Framework

The learning model was prevalent in artifacts on teacher unit plans and professional development, but from interviews, fully executing the learning model with fidelity appeared to be along a continuum as reported by teachers at both schools. That is, the extent to which teachers incorporated revision cycles as well as immersive launch and impact experiences in their studios varied amongst teachers.

Impact. Even after a student has completed and been assessed on one or more performance tasks, the studio is not yet completed, as shown in Figure 4.5 above. Studios should also include impact experiences where students take their learning and actually apply it in the *real world*, independent of rating. A teacher explained:

> The impact is almost always independent from rating, right? Rating is the step that happens before that. Exhibition or the access to having impact in the community is the celebration of learning. The incentive there is having the satisfaction of making an impact and not, "Am I going to get a grade for this?"…so students have a bigger reason for learning than just I need to pass the class and get a grade. It becomes, "Wow, we are going to do this! Really?".

There are many possibilities for how students authentically applied their learning with impact experiences. Below are a few examples that teachers had facilitated:

- After completing informative texts for a studio in a biology class, students made short films to explain their issues. The science teacher rented out the movie theatre for students to present their films to their parents, friends, and community.
- In a history class, looking at a piece of popular media about their neighborhood that contradicted the students lived experience, students chose multiple ways to communicate to the wider community the real history of their neighborhood.
- After examining how the built environment of cities contributes to greater heat retention and less carbon storage, through a combined social studies and science studio, students developed proposals for planting trees in the parking lot as a measure to combat average higher temperatures in urban spaces. Students presented their proposals to a panel, and the city's shade tree commission agreed to fund the most successful proposal.
- Multiple English teachers co-planned a coffee house for students to present poems on the theme and essential question they were exploring in their unit. Kids who did not want to speak publicly submitted a written work to the anthology.

- After writing argumentative essays for a studio on an issue of the students' choice, they spent a week remixing their argumentative essays into a piece of art that were displayed at a *Cause Fair*. At the fair, the school community was given *Core Project Bucks* to donate to the projects they liked the most. The school donated to the top three causes.
- In a math class, students applied cost analysis and geometric concepts to construct paper lanterns that were presented at an annual charity auction.

Although there are many examples of impact experiences, they are at the same time a work in progress. To give an example, at Hawkins High School, a teacher skilled in co-creating studios and creating engaging performance tasks acknowledged impact experiences have, "always been the hardest part...We would create [a studio] that would make the content personal, but taking it to the next level has always been an issue." The teacher continued to explain that may times it comes down to an issue of timing.

School level changes had been made at Hill Valley to better facilitate impact experiences. The school created a new full-time position of Partnership Coordinator to build connections with local organizations and businesses to provide students with a greater variety and more authentic impact experiences.

The Core Project has a vision and mission for giving students agency through authentic experiences that create direct impact on their lives and community. Impact experiences, even if still a work in progress, appeared to help drive a more authentic studio design. Many authentic impact experiences had been developed by teachers, and some teachers were striving to improve on developing more meaningful impact experiences.

Scaffolds for Agency

A primary goal of The Core Project's educational model in teaching competencies is deliberately supporting students in becoming independent learners – to learn how to learn. One teacher articulated a common mindset:

> So, that's an important part of skills-based learning…is understanding that you're never going to hit all the content, but if you hit it well, students can fill in the missing content for themselves as needed in their lives, for the rest of their lives. If you are creating lifelong learners, you don't have to teach them [it all] in four years, because they aren't done learning when they are done with you.

To guide students in becoming independent learners, the teachers at Hill Valley and Hawkins use a variety of familiar scaffolds that repeat themselves across studios and disciplines. Such structures include *studio guides*, *templates*, and the competencies themselves.

Studio Guides. Studio Guides are student-facing websites or slides that help students identify where they are in the learning cycle, choose activities based on their needs and interests, and complete scaffolded formative tasks (from Hill Valley website). Students can open up a studio guide and see almost everything – the essential question, required performance task, competencies they will need to demonstrate, content knowledge resources, and scaffolds that guide them through the competencies. Instead of waiting for what the teacher will disclose in the upcoming lesson, students can see everything they will learn by navigating through a studio guide. So, in theory, a studio guide is designed in a way that a student could independently use it to complete a performance task. The design of a studio guide, therefore, puts teachers in a natural position to assume the role of facilitator, coaching students through the process of accessing and

using the resources provided in the studio guide. A modified (for presentation purposes) example of a studio guide as a website is shown in Figure 4.6 below.

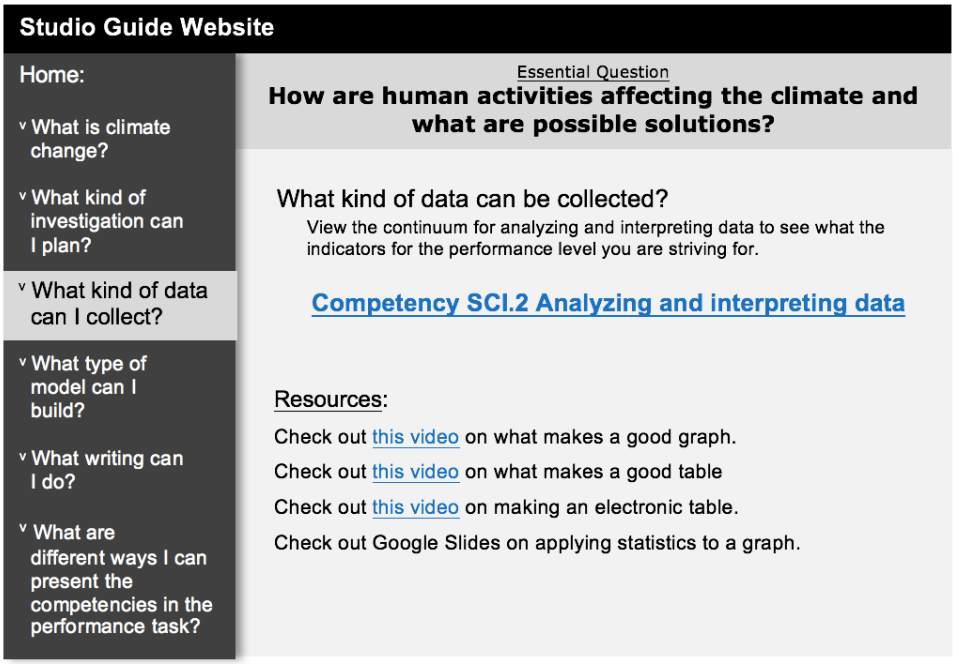

Figure 4.6. Studio Guide – Website (Modified for presentation purposes)

Templates. Templates are purposeful tools that help students process and organize new information, practice new skills, and apply learning strategies (from website). Templates can be broken down into the sub-categories – *performance task guides* and *learning activities*. Performance task guides are learning scaffolds that are websites or presentation slides that provide students with information on how to perform a performance task. Performance task guides serve a similar function as a traditional textbook as they contain the information students can read and go back to as a reference, but they also have their own unique structure and focus on skills rather than content. Figure 4.7 below provides an example of the *performance task guide* for the competency of *Argumentative Writing* that has been modified for presentation purposes. The slide to the left acts as a *home base* and is present in all performance task guides.

The slide to the right is one of many that addresses the question: *How do I write an argumentative essay?*

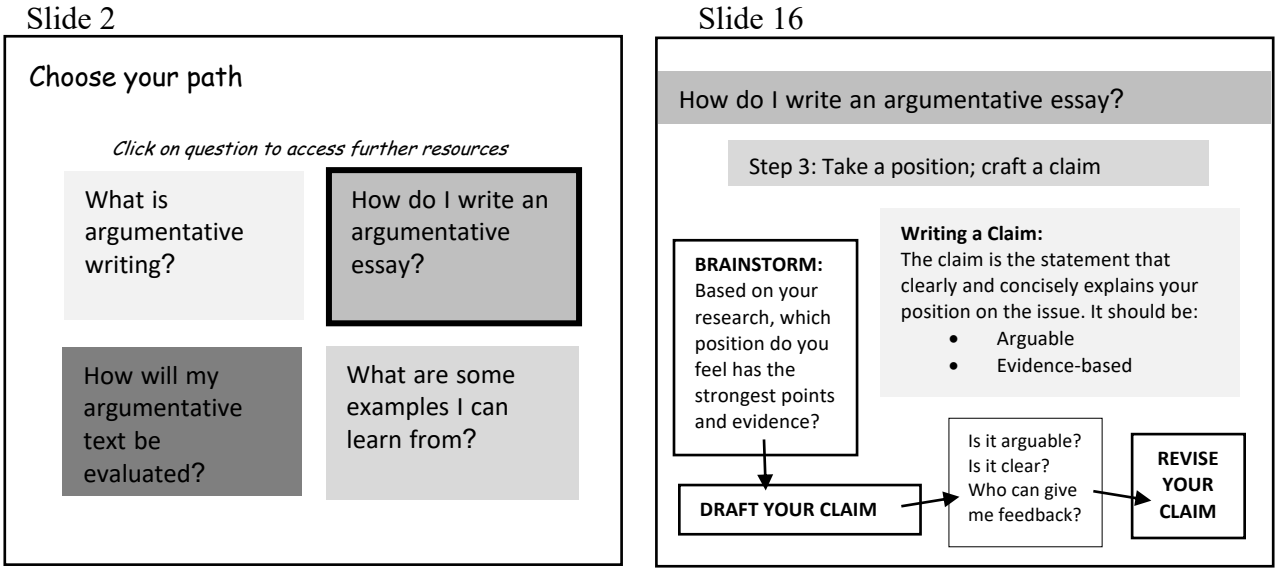

Figure 4.7. Performance Task Guide (Modified for presentation purposes)

A noteworthy part of performance task guides are *exemplars*, which are examples of proficient work for a particular competency. In Figure. 4.7 above, exemplars would be found by clicking in the box in the left slide titled: *What are examples I can learn argumentative writing from?* The studio guides reviewed were found to have multiple exemplars that students could view to (a) more clearly understand the level of work that is expected of them, (b) spark ideas for their own product, and (c) use as a learning tool to go back to and compare their work to.

In addition to performance task guides, *learning activities* are scaffolds that help students process and organize information they are learning. Learning activities exist for multiple independent learning strategies such as: (a) taking effective notes, (b) assessing the credibility of sources, (c) constructing paragraphs, (d) summarizing information, and (e) previewing texts. Below in Figure 4.8 are examples, among dozens, of learning activity templates; again, modified for presentation purposes.

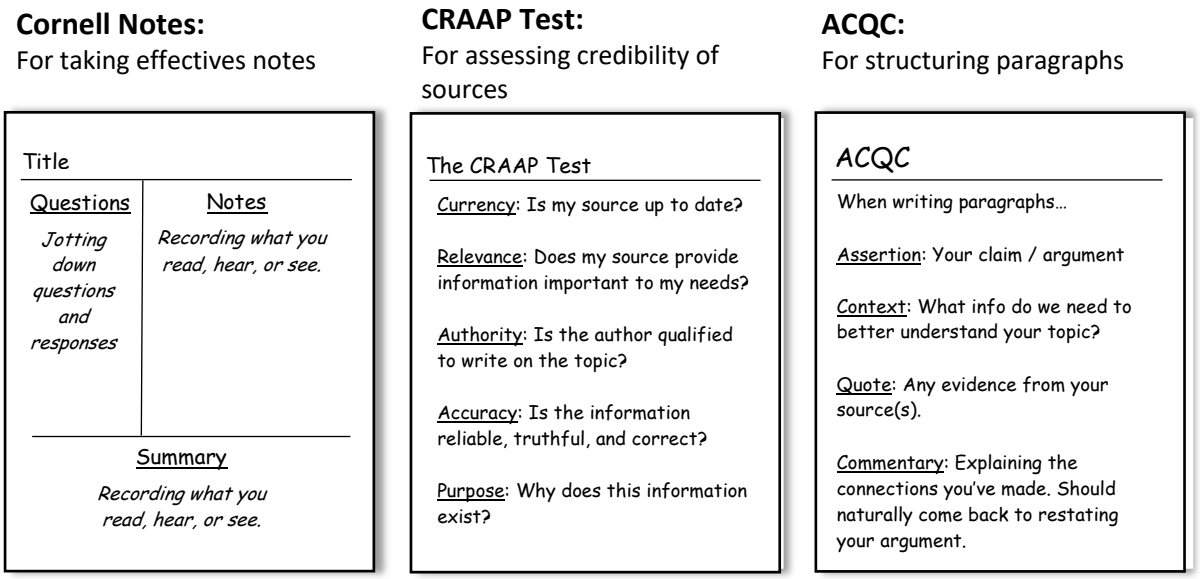

Figure 4.8. Learning Activities

Scaffolds Over Time. Stated prior, the scaffolds at The Core Project are intended to provide students with greater agency and to facilitate their ability to independently learn. Thus, scaffolds have greater significance when viewed across a student's learning experience in high school rather than just one studio. The scaffolds at Core Project schools are designed to foster student agency through their consistent use and deliberate removal over time.

Regarding consistent use, although the content and rigor may change in different studios and across different classes, the scaffolds (studio guides, performance task guides, and learning activities) can be used consistently across classes. A Core Project leader reported that at Hill Valley, most English and social studies teacher consistently used these resources, along with some other teachers from other disciplines. It appeared that these scaffolds were less utilized at Hawkins High School overall, although participants from Hawkins in this study did speak to these scaffolds.

The Core Project scaffolds are designed to provide a consistent framework concerning how to approach learning so students can become more familiar, and thus ideally more confident, in learning more independently. In addition to the scaffolds described, the continua itself is a scaffold for agency that acts in the same manner. Students regularly engage with the continua as a tool to both create and self-assess their work, and students see the same competencies throughout their high school career. A Hill Valley English teacher commented on the benefit of using the same continua school wide:

> You definitely see that growth…The Year 1s, they needed a lot more hand holding and explanation. But man, when I had my Year 3s, they knew what [competency] ELA 1 was. They know what it is so they can be more independent with it."

Scaffolds, particularly the competencies in this instance, remain the constant, and it appears this familiar structure can contribute to growing self-efficacy and agency in learning during students' high school careers.

Continuing to view scaffolds from a comprehensive view, for those at The Core Project there is an intentional effort to remove scaffolds as students progress through their high school careers. Initially, teachers provide more explicit structures to guide first-years and challenge students to be more independent in their navigation of studio guides as time goes on. A science teacher explained this process by first modeling how students may respond to exemplars, "Oh, I just seen him do it. I just need to do the same thing and put my own stuff in." The teacher continued:

> [The templates] are really helpful, but when you are trying to get the kid to grow, that's when I would be like, "don't give it to them." When they get to 11th [year] you might

> stray a bit further [from templates]…and say, "Now I need you guys to push yourself a little more."

The teacher even added, "I'm in favor of 12th grade being an entire independent research study." Overall, teachers spoke both to the importance in templates in supporting student learning, and the eventual goal for each student of removing these scaffolds to have them engage in learning more independently.

Research Question 2: How do competencies influence teacher practice?

This section addresses the question, *How do competencies influence teacher practice?*, and will explore: (1) the dynamic competencies generate, (2) teacher mindsets and themes, (3) instruction, and (4) professional development.

Dynamic Competencies Generate

Competencies are skills, and, with this in mind, an interesting dynamic emerged between competencies and content as well as between competencies and project-based learning.

Competencies Push and Pull Content. In conversations with teachers around the competencies, one of the most prevalent themes was the tension or balance between competencies and content – in other words, skills and content. Simply stated by a teacher, "the content vs. skills debate is always there in some way, shape, or form when you are working." However, this relationship was complex; one of both tension and support. This relationship is modeled in Figure 4.9 below

Figure 4.9. Competencies & Content

Considering the relationship between competencies and content, teachers spoke to how high school curriculum has historically been organized by what content is taught, and expressed a need to instead emphasize skills. One teacher expressed this common belief among teachers:

> If I'm a bio teacher and I'm walking into the room I'm going to be like, "we got to do Punnett Squares, and we got to do cell division." And you are used to defining your [discipline] as a list of content. Social studies teachers are used to, "I teach U.S. History, I teach World History, so I got to do the pilgrims and then I got to do the first Thanksgiving, and then I've got to do the American Revolution"…and [then] you always run out of time in the 1960s and 1970s.

Another teacher discussed the traditional way of organizing curriculum and argued, "You can't teach the world in a simplistic way…we should stop presenting it in a simplistic way. I think we've been doing that for centuries now, and that's the problem." Overall, talking with teachers across disciplines as well as The Core Project leaders, conversations naturally landed on an acknowledgement of a historically content-centric curriculum and the need to shift towards skills.

Determining Essential Content. Despite their emphasis on skills over content, teachers still held very strong beliefs about content and recognized its importance. One teacher emphasized:

> I came into The Core Project incredibly interested in helping students develop skills while they were learning content. But I also have very strong opinions about the type of material that we should be exposing them to.

Teachers' opinions of what material they should be exposing their students to was motivated by many shared overarching aims for what they hope their class to accomplish. For instance, a

biology teacher aimed for her kids to make informed decisions about their own health, their children's health, and their parents' health. The social studies teachers, both at Hill Valley and Hawkins, believed strongly in developing truly civically engaged students. Content to teachers across disciplines was important because of how it related to the higher aims of the course.

Competencies at Hill Valley and Hawkins were a type of lens that promoted critical conversations and decisions on what content was necessary. For example, a teacher gave an example of a conversation she might frequently have with colleagues:

> We are going to do the building of the Great Wall today. Okay, tell me why. What skill are they going to practice when they are looking at this, and then how are they going to apply it authentically today? And if a teacher can't give you that justification, it's okay, time to move on. Find something new. So, it's great. [The competencies] challenge us as teachers to constantly reflect on why we are choosing, what we are choosing to put in front of our students and really make good choices.

From this example, competencies can lead teachers to critically reflect and discuss together what content is important to be covered. Instead of following a set curriculum, teachers take on a greater role of *teacher as designer*. A social studies teacher reflected on this emerging role:

> How do you balance [content and skills]?... I think it shifts a bit of burden on ourselves as teachers to be the content experts…teachers with professional ethics as far as what it means to be a social studies teacher…designers that hold ourselves accountable to using the important content in what we do.

The teachers interviewed accepted the responsibility of developing a necessary and meaningful curriculum, and the competencies appear to help in facilitating these conversations. This concept of competencies informing content is modeled in Figure 4.10

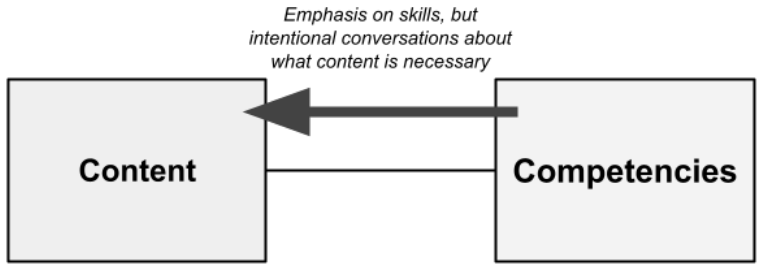

Figure 4.10. Competencies Influence Content

Fluency Over Memorization. In addition to ensuring that the necessary content is taught, many Core Project educators also acknowledged the importance of content to master the competencies. A Core Project leader emphasized:

> You have to test content knowledge. You have to…because when they get to that performance task and they don't know what an organelle is, they can't do it…[Also for math], you can't [only] do project-based math and build fluency. I will argue that to my grave. And I'm a huge project-based learning fan. [But math] requires a continuous acquisition of skills…We're not against quizzes, we're not against tests. What we are against is this idea of not measuring mastery. Giving kids Ds and moving them along saying that they are ready for the next level when they're not.

This statement acknowledges the importance of content in ultimately mastering skills, and emphasizes the commitment to ensuring students have learned. This insight led to a discussion with the Core Project leader on how to help students accomplish necessary content if competencies are what is assessed. The leader suggested treating a competency like a portfolio that includes a performance task, but also requires assessments that *unlock* the performance task, and which could also be retaken if mastery has not been met. A science teacher also spoke to this strategy when discussing how she teaches the competency of *Planning Investigations*. Content

was recognized by all teachers as essential to learning skills, and teachers shared strategies such as using portfolios to ensure students are prepared to effectively engage in performance tasks.

A key distinction in understanding content that was revealed in conversations with teachers is that of fluency rather than memorization. Teachers believed that students should have a strong understanding of concepts and information, but should not necessarily memorize them. As one teacher explained:

> Any information that they use for the most part, they collect it on their own…that's not memorizing information. I have an [awful] memory. So, I am trying to teach them to collect and use their own information.

This teacher viewed content as vital but wanted students to engage in it in a more functional, pragmatic manner. Similarly, another science teacher argued how memorization is unrealistic and narrowing:

> I don't believe any test should be closed-book tests. I believe that all tests, all quizzes and tests, should be open-book. Because what person just can't look up something if they need to find something out. That's not the point. If that's the point – [you're assessing] on a very narrow basis.

This science teacher held students accountable for demonstrating knowledge before moving onto competencies, but did not constrict this knowledge to what students could just recall. These examples assist in demonstrating the distinction between memorizing content and information fluency. Information fluency involves the ability to acquire, process, re-access, and apply information. For instance, students *fluent* in content knowledge on cellular respiration could access a model they developed from previous learning activities to help them with an explanation, instead of having the barrier of not succeeding in this skill because they could not

recall the reactants and products of this biological process. Added to the model in Figure 4.11 below, is the concept of content supporting the performance of competencies, with particular emphasis on information fluency.

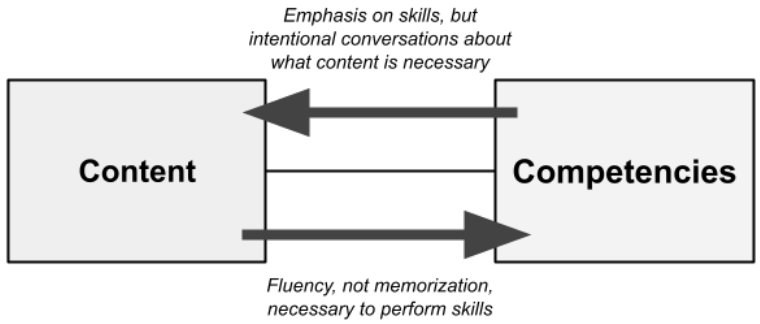

Figure 4.11. Content Supporting Competencies

Concluding the dynamic between competencies and content, the theme of *content vs. skills* was present in every interview conducted with teachers or Core Project leaders. Some teachers shared that this was a major challenge in their practice. Teachers largely embraced skills but also had incredible intentionality when choosing what content matters. Further, teachers viewed content as necessary to perform skills, emphasizing fluency of information over memorization.

Competencies Push and Pull Project-Based Learning. Before discussing competencies and project-based learning it is important to define project-based learning and to first discuss the relationship between content and project-based learning. In project-based learning, students develop a product, performance, or event, solve a real-world problem, and investigate a topic or issue to develop a solution to an open-ended question (Condliffe, 2017; J. W. Thomas, 2000). Project-based learning versus traditional curriculum, that focuses primarily on content, can be viewed on opposite sides of a spectrum. Traditional content emphasizes a broad range of

information, whereas assessments are designed to narrow in on specific concepts while putting less priority on relevance and authenticity. Project-based learning, conversely, focuses more on the relevance by solving real-world problems and typically puts less attention on students learning specific concepts.

With this background in mind, a prevalent theme that emerged from the data was a dynamic between competencies and project-based learning. Competencies began to be viewed as *in the middle* of content (traditional curriculum) and project-based learning. Like the dynamic between content and competencies, the dynamic between competencies and project-based learning was that of both push and pull. This concept is modeled in Figure 4.12 below.

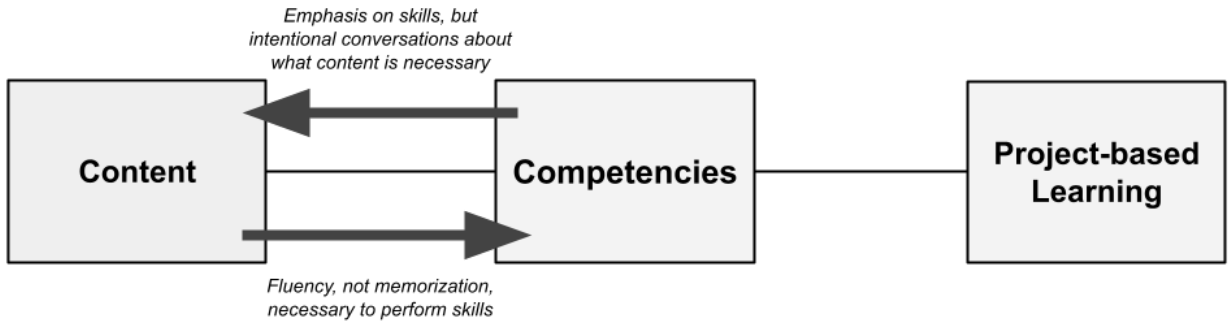

Figure 4.12. Competencies & Project-Based Learning

Giving Structure to Project-Based Learning. One component in the dynamic between competencies and project-based learning found in the data was how competencies can *pull on*, or *ground* project-based learning towards having a more defined structure. For instance, a school leader expressed the problem with overvaluing project-based learning at the expense of structure:

> That is a tension that we are constantly navigating and it's my biggest complaint about project-based learning. I think project-based learning is awesome, and I think kids should build and design and do all of that…But if we are always designing around projects and

never being intentionally about what we want students to know and be able to do - that we're going to get to the end of school and maybe they will have learned something maybe they haven't.

Although the Core Project values authenticity and impact, there was a recognition of ensuring that students learn specific concepts. Competencies were found to be a mechanism to help ground project-based learning to specific targeted skills. One science teacher who has been doing project-based learning for decades described the structure and guidance competencies give:

> [With the competencies] you know that they're learning 21st century skills and the kind of skills that are going to help them function in a world that we have today a lot better. So, it forces you [as a teacher] to make sure. It's harder because you're not free anymore. You can't just have fun and do projects and not worry about that…you have to make sure all the things that you are doing are aligned to these competencies.

Competencies can act as a forcing function to ensure teachers pull the open-endedness of projects towards well-defined skill-based learning targets. Figure 4.13 illustrates this concept below.

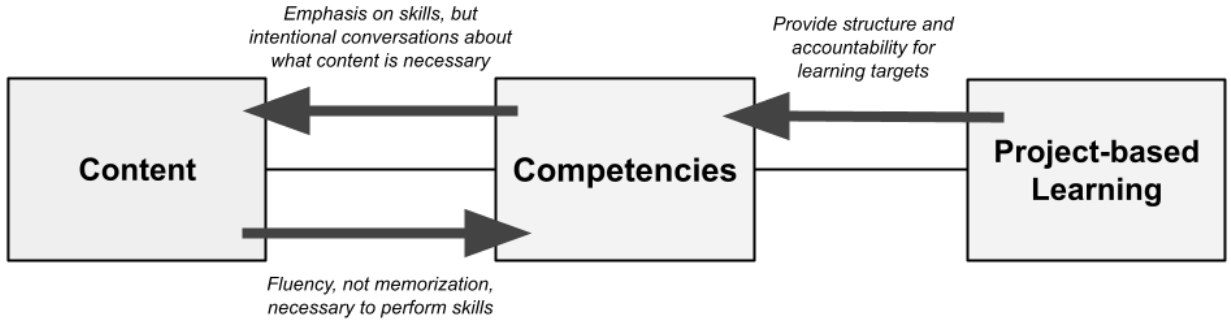

Figure 4.13. Competencies Structure Project-Based Learning

Competencies Promote Project-based Learning. Although competencies were seen as a way to rein in the loose structure of project-based learning, simultaneously they were viewed as a way to propel the authenticity of project-based learning. Reiterating from before, a Core Project leader explained, "We were very intentional with [writing] our continua that you can't assess it without doing a performance-based assessment. It's impossible." A teacher shared that she had joined Hill Valley because of her interest in project-based learning and commented on the connection between competencies and project-based learning: "We do both. You *have* to almost. I don't know how you wouldn't. So, they kind of go together – the project-based and the competency-based." This statement conveys that project-based learning is essentially inevitable with competencies. However, another teacher admitted that you could teach the competencies in a *content way* without getting to a bigger picture or addressing an essential question and expressed the need to ensure this in planning. Nevertheless, the competencies, being skill-based and requiring students to create a product for a performance task, do appear to aid teachers in thinking how their units can address an authentic essential question and a real-world problem. This concept is modeled in Figure 4.14 below.

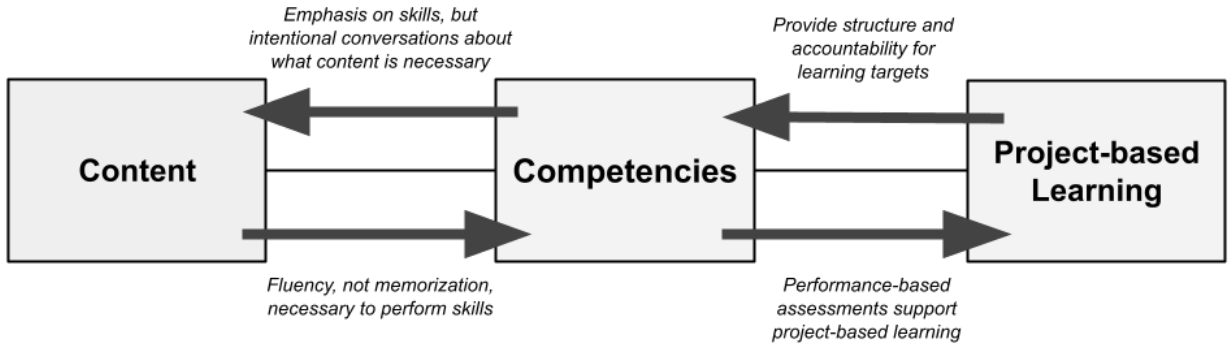

Figure 4.14. Competencies Support Project-Based Learning

The authenticity that the competencies allow was discussed by many teachers as a large reason why they embrace teaching with the continua. For instance, a math teacher shared,

> [Students] may have to learn how to do a derivative, but they have to apply it to something. So, competencies kind of make them take it to the next level and think about it. That's the most important part for me.

Similarly, a science teacher discussed:

> They do have some really cool projects that they've planned and take their own initiative on…you can see where the kids take it…you can really play to the kids' strengths…and just seeing they take pride in their own work is probably our biggest success…A lot of our kids don't want their stuff thrown away.

Many similar examples were provided by teachers speaking to authenticity as a major advantage to teaching with the continua.

Although competencies can promote a larger authentic experience, a tension concurrently existed between the two as competencies could also make it difficult to fulfill the project aspect of a studio. At both Hill Valley and Hawkins, many students begin their first-year multiple grade levels behind in many skills. Thus, teachers spend considerable time helping students master these skills, lessening the time for a larger project or impact experience. One teacher stated, "You get so bogged down in the particular skill. So now you have to actually go back to the project, which is a lot." Another teacher shared this similar difficulty with working to bring his students that are behind to grade level:

> So, for me, in good conscience I'm immediately trying to build them up. And this idea of this implied conceptual project…that performance always seems to fall to the wayside because I want to get [the students] where they need to be.

In practice, ensuring students have met the competencies can pull away from the project and impact experience.

Ultimately, there is a complex relationship between competencies and project-based learning that teachers work to balance. For instance, a science teacher explained:

> I think the that project-based part is where you can build relevance, engagement, and ownership for the kids. Connection to who they are. Giving them voice and choice, and how the product is going to look. So that part, the project-based part, is where that happens. So, the hard part is balancing the [project with the competencies]

Overall, competencies provide structure and accountability for learning targets, and the competencies themselves facilitate the implementation of authentic projects. Concurrently, teachers need to balance the authentic impact with ensuring students have met the competencies.

Teacher Practice: Mindsets and Themes

In addressing the question, *How do competencies influence teacher practice?,* it is necessary to recognize that the competencies were deliberately written with the purpose to transform teacher practice. A Core Project leader emphasized that "the competencies are important [for assessment], but the role that the competencies play is even more important in changing teaching and learning." When asked to elaborate the leader responded:

> If you're not implementing these competencies across your day and you're still sort of having traditional instruction and then sometimes they're doing more authentic things – you're not really getting to the root of the problem…The competencies are a way to uncover that and force you to do something different. They're like a forcing function to changing the status quo.

Competencies are designed to change teacher practice, and this section of the findings seeks to explore if and how teacher practice may be influenced by competencies. Broader themes of teacher practice, analyzed from the data, will be presented and include: larger aims; honing practice; teacher as facilitator; using the continuum to facilitate; learning to teach skills, competencies transcend disciplines; and a commitment to literacy.

Enduring Understandings and Aims. What continually manifested itself in the data extended beyond the competencies themselves to overarching aims to empower students and foster agency. Indeed, many examples to support this emphasis on empowerment and agency have already been discussed in this paper. For instance, the Core Project's mission involves empowering learners to build agency. This is reflected in the learning model which provides students with authenticity through performance tasks, impact experiences, and an overall commitment to relevance and choice. Student-facing scaffolds such as studio guides and templates are intentionally designed to provide students with greater autonomy to engage more independently in learning. Further, in discussing what content to include in curriculum, teachers spoke to purposeful goals for how they hope to empower students to engage in their particular discipline authentically.

Themes of overarching aims to empower students as well as to address essential themes in particular disciplines continued to manifest itself in the data. For instance, a social studies teacher emphasized:

> The competencies are amazing but what do I want to really teach these kids? Once you figure that out then you're like, "Alright what are the best type of projects that would allow me to get that across?" Once you do that, then you're like, "Okay, Let me look at the competencies. How can I fit these competencies into the project?"

For this teacher in particular, the competencies were a helpful tool to guide students towards the greater aim of understanding how history, society, and government affect their current circumstances and how to independently and critically navigate their lives and engage civically.

The most recent professional development that English and Social Studies teachers at Hill Valley and Hawkins engaged in with the Core Project further highlights the emphasis on overarching aims. Using social studies as an example, during the professional development, social studies teachers collaboratively discussed overarching aims around their discipline and agreed that students should engage in the following essential themes: the movement of people, conflict and cooperation, greater themes in government, social change, and human environment interactions. These themes inspired the topics and essential questions for studios, which, in turn, influenced which competencies would could best address an essential question for a unit. The nature of this professional development illustrates that overarching discipline aims are intended to be a focal driver to curriculum development, and the competencies act as a support or means for students to reach these greater aims. Teachers also revisited studio design during professional development, which focused on reflecting how students could engage more authentically by better revising essential questions, creating new authentic experiences, and allowing for relevance and choice. Conclusively, the learning model, scaffolds, teacher beliefs, and the most recent collaborative professional development work demonstrate that competencies need to be understood in how they contribute to the larger aims of empowerment, agency, and essential discipline themes.

Honing Practice. Discussed in every teacher interview, one of the most prevalent themes in the data was how the continua had sharpened teacher practice. A teacher who had previously

taught 17 years before using competencies described her experience over the past five years of teaching with competencies:

> It's been amazing. It's been transformative. I wish I would have been able to teach with competencies my whole career…They make it really clear as to what skills matter, what skills to focus on, how to help students understand where they are excelling, and where they need to go…It hones your practice; it hones your mini-lessons in writing; it hones design because you have to go to that skill every single time…You have to be willing to put [the traditional] mindset aside and really think about what you are going to teach it in a more focused way…In our model, you're not going to get by with worksheets. It ups the ante for teaching, your teaching practice.

This teacher viewed the competencies as a tool to improve her practice in several ways.

Teachers frequently elaborated how the competencies guided the decisions they made about curriculum design and lesson planning. "You have to be really strategic about planning, and it can be challenging," one teacher stated. Similarly, a school leader further explained what is "powerful about the continua is it's not just an assessment tool. It's actually the design tool." Keeping this in mind, another teacher explained her thought process in planning using the continua:

> Am I actually accomplishing this skill? Let me see. You have to be really critical of all your lessons right, because it has to be aligned to a skill, and you end up getting rid of a lot of stuff, and making stuff to make that work. You think of things you never thought about it before. So, I think it's a much higher level of practice as a teacher to use competencies.

Reflected across the interviews with teachers was how the continua sharpened teacher practice by providing clarity on skills while simultaneously pushing teachers to hold themselves accountable to these skills.

Using the Continuum To Facilitate. Many teachers discussed having a mindset of *teacher as facilitator* and how the competencies assisted in this approach. A teacher spoke to a shared mindset at Hill Valley, "You aren't teachers, you are facilitators. You are there to empower kids, not to tell them what to do." Teachers commonly discussed that facilitation involved assessing and providing continual feedback for students to improve on their work. One teacher explained that when using competencies, "your mindset changes because your job is to always assess. Where are my students right now, and how do I move them [along the continuum]?" Similarly, one of the Core Project leaders emphasized that by teaching to the continuum:

> It forces you to focus most, if not all, of your time to giving feedback to kids to revise their work…The teachers that have been with us the longest have completely changed their practice…to go really deep on less content and do lots of revision cycles, because students learn from the revision process more than any kind of learning.

According to this Core Project leader, revision cycles are critical for learning skills and the continua aid in supporting this process. Moreover, another teacher emphasized, "Revision is part of the process. Nothing is ever a one and done ever." Overall, teachers approached their practice as facilitators, and many commented how the continua aided in focusing their attention on providing feedback and planning explicit time in the learning progression for revision.

Meet Students Where They Are. Teachers also discussed how the continua allowed them to differentiate – to meet students where they are. Specifically, teachers explained that the

continua were helpful in providing (a) certainty in reporting students' current level of understanding and (b) a roadmap to help students grow. Concerning the level of certainty in reporting, one teacher explained:

> With the indicators as specific [as they are on] the continua, I can really say for certainty, any student that is sitting at a 10 in this skill knows how to do this, this, and this… It isn't a 70% is passing mindset, [that] once you hit that minimum amount, we move on and we don't care that you didn't learn the other 30%...Parents know this is what my student is succeeding at and what they aren't. Universities know, this is the kind of learner we are getting.

This teacher, among others, reported a student's performance level (i.e., Level 6, Level 8, Level 10, etc.) provides a clear picture of what a student can and cannot do. Rather than having general information communicated by a letter grade and not knowing what gaps in knowledge each student might have, teachers reported having more specific information that allowed them to meet students where they are when providing instruction and feedback.

In addition to having an accurate picture of student proficiency, teachers also discussed how the continua provided a roadmap to help students grow. One teacher described how the continuum helped with the daunting task of guiding students that needs to move up multiple performance levels:

> I need to get this kid to a 10 and they're at a 5. That is *hard* to think about. But we already have it built out like a road map to get them to that 10. The thing I love about [competencies] is it does give students the ability to build. They feel like they are achieving something. Maybe they are at a Level 5 when they come in. We're able to get them to a Level 7, and they just see themselves improve. It's more of a stepper.

Similarly, another teacher shared how her mindset has changed to meet students where they are and helping them progress:

> As a teacher [the competencies] change your mindset from, "What do I need to do to get everyone to pass this year?" to "What do I need to do to make sure that every student has learned something this year?" [That] really causes you to up your game… Once students trust that it is your job as much as theirs to fill in that gap between the 7 and the 10. And don't worry, I'm going to get you there, and I'm going to give you the opportunity to get you there…the way we use these [performance levels] is to map out, and then [determine] what has to come next. What do we have to do together next, so by the end you get there? Because at the end of the day it's where you are at the end that counts.

Reflected by this teacher's statement is a mindset to helping students grow by using the performance levels as a map for students to progress in appropriate, relevant, and manageable steps. In addition, this teacher also highlighted it is necessary for students to feel that the teacher is there to support them and provide multiple revision experiences and opportunities. As a whole, teachers reported they were able to differentiate and facilitate student growth by using the continuum to accurately assess student understanding and move students in feasible steps across the continuum throughout the year.

Continuing with the teacher's statement above of "what do I need to do to make sure that every student has learned something this year?", many teachers spoke about how they enjoyed being able to push students that have already met mastery. As one teacher explained:

> We've all had tons of kids that come into the class already at grade level. And in the convention system it's like…my job is done here. And the [competency-based system] creates either an incentive or the ability to say to that student…I am going to be able to

> demonstrate that you grew, that you are a year more talented, a year more proficient than you were when you got here.

A science teacher provided a similar sentiment discussing how both the teacher and students have adopted more of a growth mindset:

> You know there is never a limit… [There isn't that mindset of] "I can't get smarter because he just gave me a 100%, so I'm done." Whereas with competency-based education, that doesn't limit them. You can always get better.

Lastly, an English teacher described the enjoyment she gains from being able to push her students, "I love it when I challenge them with the 10, 11, 12, and they go for it! It really allows students to stretch." From multiple teacher perspectives, not only does the continuum allow teachers to differentiate for students that are behind grade level, it does not limit rigor for excelling students as they can continue to pursue the next performance level.

Moving students across the continua for each competency is a multiyear, multi-teacher, cross-discipline endeavor requiring system wide transparency. The learning management system developed by the Core Project allows a student, all necessary educators, and parents to see a student's competency dashboard – which displays the student's current performance levels in the competencies. A Hill Valley teacher explained that this system wide transparency can provide useful data for informing instruction: "[The competency dashboard] can be *really* helpful in supporting a student…it gives you a very specific road map, that future teachers know this is what the student needs support with." For example, a history teacher may also be using an ELA (English) competency for a new studio. Looking at the competency dashboard, the teacher may recognize that some of her students are behind in that particular ELA competency. This teacher can differentiate and proactively employ resources so these students can engage in the

performance level they are still striving for while also participating in the whole-class lesson. Thus, the competency dashboard provides teachers with helpful data to support differentiation and allows multiple teachers, even from different disciplines, to work in supporting students' advancement in any particular competency. Overall, Hill Valley teachers that mentioned the competency dashboard reported it as a helpful tool in viewing and using student progress data.

In conclusion, teachers communicated how the continuum supported differentiation. Teachers commented on the clarity of the continuum to communicate what students can do and how the continuum can be used as a *road map* to aid students in progressing in manageable steps. Teachers pointed out that students that had met mastery *early* could be challenged with the next level of rigor on the continuum. Expanding to the school-wide level, some Hill Valley teachers spoke to how the competency dashboard was helpful in communicating students' current level of understanding.

Learning To Teach Skills. In line with the phrase, *what gets measured gets done*, because competencies are how performance is assessed at Hill Valley and Hawkins, significant attention was given to teaching skills. As one teacher shared:

> Our grading system is specifically built around harnessing that skill. If I was in that more traditional model, it would be a lot more challenging for me [to address skills] ...whereas it's literally built in our schools for the students.

With competencies, teachers are naturally able to allot more time towards thinking about how to best teach skills.

Teaching with competencies is unique and new, and, as a result, many teachers were continuing to grow in how to best explicitly teach skills. For instance, one teacher discussed how she had originally continued to use traditional methods when starting teaching at Hill Valley:

> I would give worksheets and [more traditional assignments] and grade them on that and convert it to competencies, so it wasn't quite competency-based. I've definitely had to revise my craft, to make it more skills-based assessment…making it more engaging to the students and [providing] more student voice.

Similarly, another teacher discussed that he and colleagues had grown considerably in their practice in the past five years, previously putting too much emphasis on content without explicitly developing students in skills:

> I would teach them the content and then just randomly give them the competencies. I would be like, "Okay, write a scientific question, but [wasn't] teaching them [how to]. Now we, this past year, we finally had a breakthrough where we are finally starting to teach the competencies and we are using the content like a guide to teach competencies …before it was reversed.

From both examples, and other conversations, teachers had advanced their practice from more traditional instruction to directly teaching the competencies.

Regarding strategies and approaches to teaching skills, a common theme amongst teachers was more deliberately and intentionally using the continuum to structure lesson planning and studio design. For example, a Core Project leader shared:

> How do teachers know how to teach kids? Well, if you read the language of the continua - you can't get [a particular] rating if you're not addressing each indicator. [The continuum] becomes a tool to [help] teachers better teach what students need to know and be able to do."

This statement demonstrates how the indicators of the continuum can become the learning targets for a lesson as well as the roadmap for a studio. Many teachers shared how using these

indicators in lesson planning and communicating them more explicitly with students was one of many approaches to better teach competencies.

Competencies Transcend Disciplines. The competencies were intentionally designed to be content agnostic, and this was reflected in how teachers used competencies consistently expanded beyond their traditionally viewed discipline. A Core Project leader highlighted:

> The definition of competencies for us are transferable skills. Content agnostic transferable skills. If you write a competency that can only be used in a science class, it's not a competency. Even [the competency] *Planning Investigations* can transcend to other areas. Just like linear equations can be transferred to science or social studies.

One science teacher expressed that "ELA doesn't have its own context. Math doesn't have its own context. Science and history are the places where the context comes alive." This science teacher saw her class a place where students continue their reading, writing, and quantitative skills while engaging in scientific topics and ways of knowing. A social studies teacher further stressed the view of moving past designated disciplines, arguing that "the world isn't split up into social studies, English, science, and math. Like, it's not split up at all. You have to learn how to deal with all of things at once."

Teacher beliefs on how competencies transcend their disciplines were reflected in how teachers pull from multiple competencies, regardless of discipline, to fit the needs of the performance task(s) for their studios. One teacher explained that "the first two years, I was focused on using social studies competencies…but when I really started diving into the English competencies, they were just written more for what I was trying to do." There were many other examples of teachers from multiple disciplines utilizing competencies outside their subject area to support the learning for a studio. Furthermore, teachers not only pull from the full menu of

academic competencies, but, to best support the project for their studio, they almost always incorporated additional dispositional and social and emotional competencies such as *Presentation*, *Collaboration* and *Project Planning*.

Finally, a philosophy of expanding beyond siloed disciplines was illustrated by the co-created studios teachers would design together. For example, science and social studies teachers at Hill Valley worked together to create a studio that explored the intersection of environmental science and public policy. In another example, at Hawkins, biology, English, social studies, and health teachers came together to make studios centered around the theme of *What's in a neighborhood?* to explore inequality and social justice through the particular lens of each discipline. One teacher who observed this collaboration at Hawkins spoke to this studio: "I was fascinated by how they were able to mesh all of their content together. In my opinion, it was extremely ambitious. But they pulled it off!" With transdisciplinary competencies, teachers were motivated to collaborate with other disciplines to develop studios around common essential questions and themes.

Commitment to Literacy. Within the theme of content agnostic competencies, a consistent pattern that emerged from the data was an intentional emphasis and commitment to developing literacy through the ELA competencies. From interviews and artifacts of studios, English competencies such as *Conducting Research*, *Informational Writing*, *Argumentative Writing*, among others, were repeatedly found to be used by teachers from multiple disciplines such as science and social studies because they naturally helped teachers accomplished the goals of a project. In addition, English and social studies teachers at Hill Valley and Hawkins collectively committed to using the competency *Reading Critically* across their courses. For this, some teachers explicitly assessed *Reading Critically*, while other incorporated using the

competency without assessing it. Speaking to this point of using a competency without assessing it, a Core Project leader emphasized:

> This is actually a really good concept we learned. Just because you don't need to a rate a competency doesn't mean you can't teach it. The continuum is not just a rating tool. It's a tool to help teachers design high quality learning experiences.

Thus, the competencies, even when not directly used for assessment, helped in teaching skills, in this particular case, literacy. When asked about other teachers teaching ELA competencies, an English teacher replied:

> Ideally, I love it! I'm all about it. I believe everybody is a teacher of literacy. If you are a teacher, you teach literacy. I [just] think we need more time together as staff and more collaboration time to make sure that it's taught to the competencies and taught well.

This teacher, among many others at Hill Valley and Hawkins, embraced the need for incorporating ELA competencies to promote literacy.

Literacy was not only promoted through the ELA competencies, but also through the scaffolds mentioned previously, particularly *Learning Activities*. The Core Project had available abundant *learning activities* to help students preview a text, read and take notes, assess the credibility of sources, summarize a main idea, among many other skills. Many teachers also talked to specific templates they continually use to intentionally teach literacy as well. Overall, a commitment to literacy was recognized in both the natural and deliberate incorporation of English competencies, the large number of literacy scaffolds made available, and their reported repeated use by teachers in class.

Teacher Practice: Instruction

Asking "What does a typical day look like?" is a difficult question to answer for any teacher because each day can look different based on the learning targets, circumstances, individual teacher, and many other factors. However, through interviews and the artifacts collected, consistent patterns emerged that give insight regarding what instruction looks like in a classroom that uses competencies.

Preparation. Before describing patterns in the classroom, it is necessary to discuss the preparation involved in supporting learning with the competencies. Because the Core Project educational model is so new there is no *canned curriculum* that can be implemented. *Teacher as designer* is a primary principle of The Core Project model, which some teachers embrace (all the teachers interviewed), but some other teachers are reported to have struggled with it.

To provide students with greater autonomy and an authentic learning experience, lessons and studios require a large amount of *up-front* work. A teacher explained, "It's a lot more prep work before and then a lot more guiding them as the class goes. I'm more there to help them answer questions." By having resources prepared before lessons, teachers are better able to coach students during class. To give students greater autonomy, *studio guides* and *templates* such as *performance task guides* and *learning activities* need to be made. To provide students with authenticity and choice, teachers curate multiple resources (articles, readings, websites, videos, simulations, etc.). And to differentiate for multiple performance levels, teachers develop additional, necessary scaffolds. During a competency-based class, different students are engaging in different tasks as a result of choice and ranging performance levels. Speaking to this, a teacher emphasized, "You got to be really structured on what you do. It's got to be ready. It's

got to be ready when they come in." Preparing resources and structures for students to engage in appears imperative for effectively managing a class of more self-directed learners.

Teacher preparation was found to be influenced by the consistency of the competencies, years taught with them, and collaboration amongst teachers. First, because the same competencies are used in and across disciplines, many resources and templates can be reused once developed. One teacher discussed that the workload is a lot, "but it also isn't because [all my classes] use the science competencies." That is, many resources used for a studio or class can be used and slightly revised for another. Another teacher elaborated:

> You start to develop generic templates for some skills and indicators where the only thing I'm changing is the source or piece of content. I can dip into the shared folder of templates that meets my purpose and use it, and my prep is cut down considerably.

The nature of content agnostic competencies allows for the collective development of resources. Still, the same social studies teacher conveyed that resources are still frequently created as they are needed:

> Even six years in we still get ourselves in situations often where it's like, "Oh, I need to build a tool unique to this thing." So, to be most successful, teachers in a competency-based school need to be supported with more prep than the average teacher does.

Overall, the consistency of the competencies, along with collaboration amongst other teachers, aids in preparing for lessons and studios, while new resources are continually developed in response to students' learning needs.

Instruction. As teachers described their experiences in the classroom a picture of a *workshop* atmosphere began to emerge. For instance, in a typical craft workshop or art studio, students work towards a project around a certain theme, and learners come to the workshop with

an awareness of where they are going, where they are currently at, and what they intend to accomplish that day. While students are engaging in the work, the teacher primarily promotes reflection and feedback while also providing collective experiences and instruction when appropriate. A similar classroom atmosphere of this described workshop began to emerge from teacher interviews and artifacts.

From conversations with teachers, it appeared that most of class time involves students *doing* rather than teachers *delivering*. "I have 50 minutes classes. Five minutes is actually me talking to the whole group. And the rest is small [groups]," one teacher stated. Teachers almost always described students working collaboratively in groups and described their classrooms as having many moving pieces. One teacher shared, "It's hard to explain how a typical day is because it's so hectic. It's not hectic, but it looks hectic from the outside. Like I may have 5-6 groups of kids doing different things." Another teacher echoed this same sentiment that "it's very chaotic in the classroom with competency-based [learning] because the students have such a voice with what we're doing." Overall, it appears that if one were to *pop into* a typical classroom, it is likely that students would be seen working in small groups working on differentiated objectives.

Although students might be completing different tasks in class for a lesson, students "usually all work on the exact same competencies, but then they might be at different spots." Hill Valley and Hawkins do not track; meaning, students are not separated into regular, honors, etc. courses. Instead, students experience different levels of rigor for a course depending on which portfolio they are personally working towards. To accomplish this, teachers frequently create differentiated small groups or mini-lessons based on what performance level students are at for a particular competency. As a result, a Hill Valley teacher explained lesson planning as

involving, “a lot of data analysis. Like *a lot*. I have my notebook and I go through our competency dashboard [to see] where they are and what they need.” For example, a science teacher could be leading a studio around the relevant context of COVID-19 and have a lesson covering the competency *Analyzing and Interpreting Data*. All students are experiencing the same essential question, whole-class discussions, etc. around the studio. However, with the competency dashboard, a teacher can look at what performance level the students are at for this particular competency and meet them where they are. Thus, in the same class some students may be working on how to accurately present data graphically (Level 8), while other students may be developing more complex graphs with software (Level 10). Another group could even be doing college level work (Level 12) by not only creating complex graphs electronically, but also employing statistical methods to better understand the data. In addition to the system wide transparency allowed by the competency-dashboard, teachers also consistently use familiar best practices of daily warm-ups or exit tickets to formatively assess and plan differentiated groups.

Once identifying where students are at, whether with the competency dashboard or with warm-ups or exit slips, teachers shared their many strategies for differentiating and organizing the class period. One teacher has “a color-coded system and it tells [students] where they are going to be. If [the teacher] thinks they are behind in the competency, they might be doing a mini lesson with [the teacher]” Similarly, an English teacher explained that her lessons involve:

> A lot of grouping. I’m really big [on] writing workshop things. So, “hey your group, you’re over here, and your group, you’re over here” ...the students that are aiming for that 10 are sitting together for that day, or maybe they just want to sit by themselves [to work on it]. So, it’s a lot of individual grouping, a lot of charts and checklists, and this person’s here, and who needs individual conferencing?

Teachers described grouping students at similar performance levels, but teachers also stressed the importance of having students work in groups of varying abilities. Many mentioned that students at lower competencies can learn from students at higher competencies, and students at higher competencies can further solidify their understanding by actively articulating their understanding. As shown, many grouping strategies were found to be available in teachers' *toolbox* of instructional practices.

Some teachers also discussed differentiating by giving students greater ownership and choice. For instance, teachers may allow students to choose which performance level group they want to join. One teacher described that a lesson can be "almost like a choose your own adventure kind of thing. If you need an 8, do this. If you need a 10 continue on to this. If you are pushing for a 12 continue on to this." Even if students are working in groups of varying levels, differentiation is still possible as students may engage in a "common task with common instruction, but how far students progress in the task is dependent on where they are. So, it allows them to take some ownership of that."

Teachers can also differentiate by giving students choice regrading what specific skill or indicator students will work towards within a competency. A teacher shared an ambitious strategy of having multiple resources and activities prepared and ready for students to choose based on their own self-assessment of where they were at. For instance, all students in a class might be working towards the competency of *Planning Investigations* and will eventually engage in the performance task of using materials to design and perform their own experiment. However, students first need to show they have a baseline understanding of the components of an experiment (independent variable, dependent variable, control, and constants, etc.) by demonstrating mastery on what might be traditionally thought of as a *quiz*. On the class studio

guide, the teacher has available multiple resources for students to reference information on the skills and indicators of *Planning Investigation* as well as smaller practice opportunities with keys. One student might recognize she needs to practice the skill of establishing experimental variables, while another student might identify that she should work on practice opportunities covering controls and constants. When a student determines she is ready, she can go to a table and take the Planning Investigation *quiz* to demonstrate readiness to begin working on the larger performance task. If she does not show proficiency on the quiz, she will receive feedback from the teacher and engage in additional practice opportunities. The student can return to the table when she feels ready to retake a different version of the *quiz* and can retake it multiple times (the teacher mentioned she had made 8 different versions of this particular quiz). Differentiation enacted by student choice, whether it be choosing which performance level or what indicator within a competency to strive for, is designed to develop self-awareness and give students greater agency in their learning; this was a method utilized by many teachers.

Notable, although it was found that teachers have many strategies for how they exhibit the best practice of differentiation in the classroom, it is critical to recognize that competency-based education does not just occur at the classroom level but occurs at the schoolwide level as well. One Core Project leader argued system-wide rapid-differentiated support is an objective that many competency-based schools are still struggling with and, as a result, believed that too much of the burden for differentiation was currently placed on teachers. When asked how Hill Valley and Hawkins provide rapid, differentiated support, he replied, "You know, things schools [typically] try to do, which is put everything on the teacher – [in our case] to differentiate their classrooms using station rotation approaches." Thus, although teachers were thoughtful, creative, and organized in their differentiated approach to instruction, there was also an important

recognition by Core Project leaders that effective differentiation requires innovative, coordinated system-wide structures.

In summary, from interviews and artifacts, a workshop type of environment emerged for what a typical competency-based classroom may look like in practice. The majority of class time appears to involve students working on practice or their performance tasks in differentiated small groups. Although a lesson might be on one particular skill or competency, students work toward a competency at the performance level they are personally striving for. Putting the mindset of *teacher as facilitator* into practice, teachers, taking on the role of *teacher as designer*, put in significant prep work into developing resources for studios and lessons to give students greater agency. Teachers can use their developed resources for other studios, other courses, or even other disciplines and have started to build a collaborative library. Further, teachers use formative assessment and the competency-dashboard to create differentiated groups, and even encourage students to self-assess where they are on the continua and choose the appropriate task on which to work. Lastly, although teachers employ many differentiation strategies, school leaders commented on the need for improved school-wide rapid and differentiated support.

Teacher Professional Development

Supporting teachers' professional development is a primary commitment for The Core Project. A Core Project leader strongly supported emphasize the importance of professional development:

> Take the learning of your adults and the growth and development of your adults as seriously as you take the growth and development of your kids. Are teachers setting goals? Are you giving them autonomy to try new things and fail in the classroom, and

> come back and talk about it with their peers? Are you creating professional learning communities where teachers are talking with themselves and getting better at things? That's what we mean by adult learning. Are you creating pathways for teachers into leadership? Actively doing that?

This statement illustrates a firm commitment to professional development that is teacher centered. With this in mind, the most noteworthy themes related to teacher-centered professional development included (1) collaboration, (2) norming, and (3) advancing and supporting practice through teacher competencies.

Collaboration. An essential piece of the Core Project teacher-centered professional development model is supporting teachers in advancing their practice together through collaboration. One teacher spoke to the importance of collaboration, stating "we work together as a team a lot, more than we would at a traditional school, and our growth over five years in terms of planning has been a lot better." To support collaboration, each department has a common prep period where members are expected to work together to design curriculum, discuss instructional strategies, and norm work. One social studies teacher recounted an instance where teachers had quickly developed a unit together in response to a relevant, recent event. After outlining the studio, teachers had split up responsibilities, and one of the teachers described their next collaborative meeting:

> [We] come back and give each other feedback. We are going to make sure [the performance tasks] work at a level 8, 10, and 12. We designed it together; we rated it together; we did it collaboratively…and it also gives us an opportunity for the newest teachers of the department to see the veteran teacher designers and, therefore, improve

> their own practice. So, collaboration and building in time for collaboration is so important for making this sustainable.

Collaboration allowed for distributed workload, collective insight, and supported new teachers. Although explicit structures were put in place to give teachers time to collaborate, many teachers shared that time for professional development could be stretched thin with other district priorities or by simply needing more time to do the work. Thus, teacher-driven collaboration appeared to be vital for teachers to improve their practice in a competency-based system, so much that more time was still reportedly needed.

Norming. Both teachers and Core Project leaders described the process of norming as a paramount aspect of collaborative professional development. A teacher described norming:

> You calibrate scoring together when you norm. You look at a piece of student work and you score yourself. And then you talk about it as a team. The "What would you score it and why?" is really important and really valuable.

For example, teachers may deliberate on an argumentative essay that contains much effort but actually earns a low rating on the continuum. They would discuss why it does not earn a higher performance level and how to provide students with feedback to improve. Another teacher explained:

> You have to…. constantly work on your fidelity to the indicators. Norming ratings across teachers to make sure everyone maintains the same understanding of what the language of the indicator means and how they're using it in order for it to be reliable.

As this statement illustrates, norming provides consistency, but teacher and Core Project leaders made sure to further emphasize how norming leads to improvement in several areas of

instruction, predominantly providing feedback to students. For example, a school leader stressed how norming can improve teacher practice in a competency-based model.

> That professional development (norming) should happen ALL the time…looking at student work together as a group of adults and figuring out and using the rating tools, the best ways of giving feedback, the best ways of organizing your lessons so you are constantly giving feedback.

The school leader continued to underscore how important norming was:

> And any new affiliate [school] we get, that is where we are going to start. We are not going to start to convert their IT systems…We aren't going to start to replace all their courses with competencies…We are going to start very simply with, "How do you design tasks aligned to the continuum so that you can give [students] feedback and have them go through revision cycles?"…Our instructional coaching is going to be focused on how do you structure your classrooms and relationships to give more feedback to kids and do more revision.

In short, according to this school leader, the most important action to effectively guide teachers in implementing competency-based education is norming. Thus, it appears that norming can be a powerful process for teachers to collaboratively co-construct their understanding and teaching of the continuum.

Teacher Competencies. The Core Project believes that the model for professional development for teachers should be the same as the model for how students experience competency-based education. In fact, The Core Project leaders have developed *teacher competencies* that explicitly provide performance levels and indicators for what proficient competency-based teaching is. The teacher competencies are not meant as an evaluation tool, but

rather are meant to be used for coaching, goal setting, and self-reflection. Of note, the teacher competencies are relatively new as of the writing of this study, and although much information was learned about them from Core Project leaders, there was limited perspectives from teachers on their use.

The teacher competencies include (1) *Building Relationships*, (2) *Personal & Professional Growth and Development*, (3) *Mentoring through Advisory*, (4) *Designing for Engagement and Impact*, and (5) *Facilitating Personalized Learning*. An example of the teacher competencies is presented in Figure 4.14 below and includes two of the many skills that are part of the competency *Designing for Engagement and Impact*, along with their indicators at each performance level. Of note, the performance level *Novice* is not necessarily considered poor, but rather, where a teacher first implementing this model might start. While reading through the example competencies below, imagine how a teacher might use these to self-assess and set goals for planning and instruction.

Teacher Competency 4: Designing for Engagement

Skill	Novice	Developing	Proficient	Expert / Mentor
Culminating Performance Tasks Aligned to Competencies	I can preview the competencies and the continua.	I can preview the competencies, continua, and culminating performance task and provide an exemplar.	I can preview the competencies, continua, and choices for the culminating performance tasks and provide examples of what success looks like at various levels.	I can preview the competencies, continua, and culminating performance tasks, provide examples of what success looks like at various levels, and engage students in using the continua to rate exemplars.
Impact on Authentic Audience	I can facilitate opportunities to share their learning (e.g., celebrations of learning, exhibitions, display student work, student work-share fair.	I can facilitate opportunities for students to share their learning with their intended audience. I can facilitate a process to provide students with feedback from their intended audience.	I can provide my students with the support they need to implement their product or performance in an authentic context (real-world application) to impact their intended audience.	I can provide my students with support they need to implement their product or performance in an authentic context (real-world application) to make a real impact on their intended audience, and can help them find ways to extend their impact (through technology, publishing, presenting at conference, etc.)

Figure 4.15. Teacher Competencies

The teacher competencies set a high bar for instruction. For example, in Figure 4.15 above, for the skill *Impact on Authentic Audience*, the indicator in the *Novice* category which includes *learning exhibitions to display student work*, is generally a welcomed method for authentic, engaging assessment by many post-secondary educators. However, as one moves to the right at advancing performance levels, one can appreciate the high level of authenticity The Core Project aims for.

The Core Project believes that teachers should experience professional development in the same way students experience competency-based education, which the teacher competencies appear to support. Just as students would employ agency and self-awareness in their learning by engaging in the continua, teachers can independently use the teacher continua to self-assess where they are and set professional goals. For example, looking back at Figure 4.15, for the skills *Creating Culminating Performance Tasks Aligned to Competencies*, if a teacher starts at a *Novice* level, one can recognize how to advance along the continuum in manageable action steps: Move to the next performance level by creating an exemplar, the next by creating exemplars at multiple performance levels, and finally reach an expert/mentor level by more deliberately engaging students with the exemplars.

Core Project leaders reported that some teachers found the teacher competencies overwhelming and agreed that, "it is virtually impossible to work on all of those competencies at one time," and that teachers should instead "find a skill or find a specific indicator of a skill that [they] want to focus on."

Just as students are supported in using the continuum, the teacher competencies are also used in instructional coaching and organized professional development. For example, in the most recent summer professional development, teachers were working to improve their studio design

through the teacher competency of *Designing for Engagement and Impact*. A Core Project leader described the conversations she had with teachers during this professional development:

> I've scaffolded this project for you…I've given you exemplars. I've met with you one-on-one. I'm giving you feedback based on our teacher competencies. That's exactly what [teachers would do] with the kids, right! ...When we build the capacity and we develop the mindsets and make the shifts in adults, it will directly and immediately impact outcomes for kids.

As shown, professional development is designed for teachers to experience learning as students experience competency-based education in order to ideally generate mindsets that support teaching in this new educational model. This feedback process appears that it can be both difficult and fruitful work. For instance, also speaking about the most recent professional development another Core Project leader shared:

> The feedback process was really intense, and we underestimated just how hard this would be for teachers. We discovered a lot of issues during these sessions, and they ended up being some of the best PD we have ever done.

Thus, the critical conversations, framed by the teacher competencies and other scaffolds, can be challenging, but seem to be worthwhile in advancing teacher practice.

Research Question #3: What are the challenges experienced at the Core Project?

The Core Project educational model is ambitious and attempts to implement competency-based education, with the added lift of incorporating the continua, as well as a commitment to authenticity and agency. This section speaks to the many challenges of the learning model and continua at The Core Project schools. Challenges include (1) working towards fidelity (2)

mismatch between competencies and state mandates, and (3) communication with students and parents.

Fidelity. A leading challenge identified at the Core Project schools was working to teach with the continua and learning model with fidelity. It should be noted that the participants interviewed for this study at both Hill Valley and Hawkins, although still developing their practice, appeared to teach with a relatively high level of fidelity to the competency-based model. It is likely that the participants chosen by The Core Project leader for this study were teachers that were stronger in implementing competency-based education. Yet, from multiple interviews, the need for greater schoolwide fidelity became apparent. This section explores specific barriers to fidelity including: (a) the mindset shift required to teach with competencies, (b) the breadth and complexity of the continua, and, of particular note, (c) the need for continual professional support.

Paradigm Shift. Fidelity seemed to be difficult because the paradigm shift involved in teaching with competencies. One teacher spoke to "the growing pains" in the most recent summer professional development where teachers from both schools met to make a collaborative effort to "[try] to get more people on board – teaching a mindset change." Another teacher expounded upon what this mindset change entails. She gave an example on how traditional teaching methods typically involve "points for participation and points for doing your daily journal entry." She further explained:

> You have to be willing to push that aside…unless you can find a competency to match that…which you could. You have to be willing to put that type of traditional mindset aside and really think about what you are going to score and how you are going to teach it in more focused way.

Furthermore, a Core Project leader noted that it can also be difficult to break traditional thinking, even in teachers that believe in the approach. She noted "especially when things get challenging …traditional ideas teachers have in their mind creep into the authentic implementation of the competencies." Lastly, teachers entering the school are almost inevitably going to undergo a mindset change. One teacher explained that "a system-wide issue is onboarding new teachers. No one I know outside of The Core Project uses competency-based education so it's always learning something new and having to shift that mindset." Similar conversations such as the ones highlighted above illustrated a tension between competency-based teaching and traditional methods. For this reason, a Core Project leader emphasized that in her and her colleague's roles, the "most important thing we can do is break mindsets [and build] understanding [of] the continuum and the why behind it. That there is a problem with traditional grading!". Although the teachers interviewed strongly believed in competencies and spoke to the mindset shift as a distinct positive regarding their practice, they also acknowledged the hurdle this paradigm shift can pose in teaching to the continua with fidelity.

As The Core Project's competency-based education model intends to drastically transform traditional education, a dilemma arose between how to best bring the model to fruition. Specifically, Core Project leaders discussed the pros and cons between teacher-driven design and designing outside of day-to-day school constraints. The Core Project leader shared:

> You can hand the school the tools, and the school just gets better at using the tools. But I don't think that is the best way to do this work. The best way to do this work is where all stakeholders are involved in some way in the creation of things.

However, the school leader also discussed that by having a role outside of classroom teacher, he and his colleagues do not have the burden of "I have to go to school and the kids are showing up,

and I need a plan." Therefore, Core Project leaders were able start to think more outside of the box and push more against the traditional educational structures that have been historically resistant to change. The Core Project leader summarized, "So it's a tough tension because if we would have started doing totally teacher-driven design, we would not have created as an innovative model, but we would have better fidelity of implementation." Thus, educators are required to balance bringing teachers into the generating process as much as possible while also maintaining the goal of not compromising on the traditional systems that competency-based education intends to transcend.

Complexity of Competencies. In addition to the paradigm shift, the large scope of the competencies appeared to be a challenge. The Core Project has many competencies, each with its own subsection of skills, which are broken down by multiple indicators that range in complexity across performance levels. In short, the competencies are **"**a lot to unpack," commented one teacher. Moreover, a Core Project leader acknowledged, "There is a lot of competencies, and getting students to the 10 on all of the competencies is a *huge* task." This challenge is a reason that many teachers and The Core Project leaders emphasized the importance of norming and collaboratively discussing the continua to better gain familiarity and improve teaching with it. Of note, the founding teachers interviewed in this study who had been teaching with this model for five years reported and exuded confidence in planning and assessing using the continua; such an account demonstrates that despite the intricacies of the continua, it appears teachers' fluency and comfortability can be developed with experience.

Continued Professional Development. Although the mindset shift and the complexity of the competencies were identified as hurdles, many educators discussed that more continual professional development was of primary importance for achieving fidelity. Although the data

illustrated a strong commitment to teacher-centered professional development by the Core Project as shown in the previous section, simultaneously, the need for additional teacher support was uncovered at both schools. In addition, it was found that there was greater schoolwide fidelity at Hill Valley compared to Hawkins, and this seemed to be influenced, at least partially, by more frequent teacher support around the competencies. The lesser level of professional development around competencies and the learning model at Hawkins was determined to be the result of multiple factors, including: district pressures, limited resources, and that the school administration (not the Core Project) had been leading professional development in the most recent years. A Hill Valley teacher explained the divergence between the two schools:

> Because of mostly external pressures from the school district, [Hawkins] backed off their initial commitment to our model. Their school and our school have diverged greatly as far as how much they are implementing our model, or with how much fidelity they are doing it.

This teacher further recognized that there was also a need for greater fidelity at Hill Valley and believed that this was not a result of resistance to the model by teachers, but the need for even more professional development involving collaboration, norming, and coaching. She continued to discuss the necessity for continual teacher support:

> When you don't have enough training, and mentoring and ongoing support to learn to do this very different thing, [teachers] fall back on what is comfortable, on what they know…I don't think that competency-based education is a heavier lift than anything else. It's just that anything that is transformative, that changes from what has existed before, requires support, training, mentoring, …and requires a bit of auditing for compliance and

> prompt reaction when you see it's not meeting the model. And that's place that I think is tough in schools where resources are tight.

This statement argues that any major system-wide shift requires continuous support and intentionality. The Core Project leaders also discussed and reflected on the need to bolster professional development to improve fidelity, and even designed the most recent summer professional development, in part, around this factor.

Although fidelity was noted as a challenge, there was also an understanding and recognition by educators that the transition to competency-based education requires time through direct experience. For instance, conversing with a teacher about how other schools might transition to this new competency-based education model, he stated:

> If I were to be implementing this in a school as an administrator, it's a five-year project. Three to five-year project. Because people have to experiment with it, play with it, make mistakes, have successes…It's just respecting the messiness of it, while valuing the logic of it.

Other educators supported this view that teachers cannot truly know and begin to master the model without *diving in* and learning along the way. The Core Project educational model is ambitious and attempts to implement competency-based education, with the added lift of incorporating the continua, as well as a commitment to authenticity and agency. As a consequence, educators at The Core Project are, in a way, discovering and determining an idea that has never been put into practice yet. One teacher highlighted this reality: "[Our model is] constantly changing for now. We are five years in and it's still a toddler. We just learned to walk. We haven't even started running yet."

Mismatch Between Competencies and State Mandates. Every interview with teachers and Core Project leaders involved them raising the issue of the difficulty for a competency-based education model to exist within the broader context of state and local requirements. For example, all freshmen in the state take a standard biology test which emphasizes content knowledge. Because competency-based education focuses more on skills rather than memorization, the students at both schools had not performed relatively well in the past years. A teacher speaking to this this dilemma explained, "You can be a phenomenal teacher of the competencies to the students…[but] at the end of the day, we are a district school in [the state]." Thus, aligning to state tests added to the already existing tension between content and competencies. Overall, many educators expressed frustration with the state assessing information that was not important in relation to the 21st century skills the competencies were focused on.

In addition to state tests, the state requires the school to report grades each year, which is challenging for the growth aspect of a competency-based model. In most public schools, students that earn grades in the 60% range pass the class, and move on to the next grade with significant gaps in understanding. In a competency-based system, if students have not met proficiency, they are still held accountable in showing proficiency the next year. (They continue to the next year in school with their peers but are provided with additional differentiated supports). A Core Project leader spoke to how this accountability is problematic when reporting grades at the end of each year. Although the following statement refers to an affiliate school, the same concept applies to Hill Valley and Hawkins.

> Most 9th graders need longer than nine months to complete a portfolio. It just takes them longer because they have so much unfinished learning [when entering high school]. So, if you aren't able to report credit for a student at the end of 9th grade, it's going to look like

> 75% of your 9th graders are not on track, when the year before, because all these Ds were going in, 98% were on track.

According to the Core Project leader, state reports may indicate students are not on track at a competency-based school, while this same information can be hidden in the traditional grading and reporting system.

In order to more easily report student performance to the state, Hill Valley and Hawkins convert their competencies into traditional letter grades. Unfortunately, this *work around* can draw away from learning at Hill Valley and Hawkins. A Core Project leader acknowledged, "A huge compromise we make in our model is translating competency performance levels to grades. In a perfect world, we would never give [letter] grades." This compromise, Core Project leaders elaborated, detracted from the growth model and focus on proficiency the continuum intends to promote. Providing one example among others, a Hawkins teacher discussed students that are behind how towards the end of the year will scramble to complete assignments to earn a passing grade in the school's *competency-to-letter-grade* system. In doing so, students ignore using the indicators for achieving their relevant performance level and submit partially proficient work instead. The competencies are both Hill Valley's and Hawkins' graduation requirements, so students ultimately need to demonstrate proficiency. But, in the short term, utilizing the traditional grading system is reminiscent of students earning scores in the 60s to fly under the radar. In a perfect world, the educators at The Core Project articulated that the always visible, real-time competency-dashboard would replace the gradebook and simply display the performance level students are competent in for all competencies.

Communication with Students and Parents. A common challenge communicated by both Core Project leaders and teachers was the difficulty in both students and parents understanding the new model. Concerning students, for many, their expectations that were conditioned by traditional education for so long were disrupted with the introduction of the competencies. For instance, because the continua solely communicate proficiency in skills, it can be discouraging for students to look at where their understanding is marked along the continuum, when their past grades in middle school communicated a higher level – likely due to grade inflation from homework, participation, etc. A Core Project leader empathized with students:

> You can't help but think badly of yourself and be like, "you're telling me I'm working on an elementary or middle school [level] and I was getting As in all my classes in middle school?" So, it's a huge mindset shift for students.

The continua more clearly communicate what students can do, but recognizing their current levels of performance was disheartening for students according to educators. Related to this circumstance, many educators shared that a significant portion of the push back to the competency-based model from the community came from traditionally *honors* students and their parents who had previously found success in a system that rewarded compliance by taking paper-and-pencil tests, and turning in assignments.

As the continua is unfamiliar to students entering Hill Valley and Hawkins, many teachers also communicated the challenge of helping students develop an understanding and growth mindset around the new model. One teacher shared that "helping parents and students understand [the competency-based model] is a challenge. It's hard for first-year [students] sometimes. It's hard for them to grasp that it's not one and done." Another teacher stated, "That's been my number one hurdle is just building that growth mindset in all of the students." A

third teacher shared a similar experience and discussed how the continua can be helpful in guiding conversations around a growth mindset:

> The hardest part is breaking the mindset of the kids. It's more of a growth model. And they don't always get that. They are more concerned with just getting an A, instead of "let's see how much you learn." This isn't your grade. Your grade, you know, your score will change. Your score can get replaced. This is just your starting point. Just so we can refer back to it in June and then say "Cool, look how far you've gone! Back in September, you scored a 5 here or a 6 here. Now you are scoring 8s or 9s." So that to me has been the most difficult part.

In addition to the efforts teachers made to help understand the *growth* nature of the competency-based model, both schools have a *Foundations Course* which helps communicate the purpose behind the competency-based system, how to navigate their competency dashboard, and teaches self-awareness and self-management strategies using the continuum. Fortunately, teachers did report that the mindsets of students do change during their time in high school. One teacher shared:

> I don't know when it happens, but it does click. And it generally goes from a fixed mindset to a growth mindset. So, it goes from "I just need an A, I just need an A" [to], "No, how can I get better?".

The same teacher also talked about the shift in language students will use:

> [First years] will be like, 'What's the A minimum? What's the B minimum? What's the C minimum? And when you get to your sophomore year, you hear that less and less…and with seniors you barely hear it at all. They're strictly talking 8s, 9s, 10s, 11s, 12s. You don't hear any A, B, C, D.

According to teachers, eventually students do appear to grasp the model and develop more of a growth mindset in their learning, but communicating the new model is still a major challenge early on.

Many teachers and The Core Project leaders also discussed that parents, similar to students, had difficulty understanding the new grading system. One teacher talked to the uniqueness and complexity of the competency-based system and acknowledged that, "plenty of parents will say "I don't get the grades. I just don't get it." Another teacher discussed how, at the Hill Valley parent-teacher conferences that the students lead, many times parents will ask, "What's an A? Is that an A? And the kids [will say]...well no, but like I have until the end of the year to get that to an A. Right now, it's a B, but it's going to easily change." Efforts, such as parent-teacher conferences were made to communicate competencies with parents, but the deviation of competency-based education from commonly understood percentage and letter grades still made communication with parents a notable challenge.

As communication with parents was identified as a considerable challenge, it is valuable to examine different approaches taken to report student performance. For instance, both Hill Valley, Hawkins, and some Core Project affiliate schools initially reported student performance without letter grades, and only as the current performance levels achieved on the competencies In each case, this reporting did not succeed "because of the communication of progress with the community, families." For instance, [an affiliate] school tried and wasn't able to get through it because too many families went to the board or superintendent saying, "I just want a traditional grade." Hill Valley, although still translating progress on the continua into letter grades, has come closest to preserving the original reporting model as stakeholders are still able to see a platform of all the student's competencies and where they currently are on each one. Even then,

"Hill Valley really struggled and suffered through those two to three years of families not understanding before it just became normal. It just became the oxygen in the system," reported a Core Project leader. From these examples, breaking the time-based and letter-grade based structures is exceedingly challenging, but it is also worth noting that stakeholders at Hill Valley have become more familiar with the grading modification over time.

In summary of challenges around communication, teachers discussed the difficulty students have in shifting to a new system, and teachers reported a significant challenge in their practice was helping students transform their traditional mindsets around letter grades towards a growth mindset around competencies. Intentional supports such as a *Foundations Course* existed and teachers did report that students begin to receive the competency-based model over time. Parents, like students, have difficulty understanding the new competency-based model, and initial attempts to have performance reporting methods independent of traditional letter grades have been unsuccessful at this time. In discussing the big picture of competency-based education with The Core Project leaders, both agreed, that in an ideal situation, the continua should be present throughout a student's entire education. One school leader even emphasized, "Pre-K!, Pre-K!" One school leader explained: "To really get kids to those highest levels of the continua, it should just be what [students] know in education."

Summary of Findings

This chapter provided a detailed analysis of patterns and themes found in the data to answer the research questions (1) How are competencies employed at The Core Project (2) How do competencies influence teacher practice, and (3) what are the challenges experienced by The Core Project?

Competencies are transdisciplinary, content-agnostic, skills that are assessed along a continuum. There is a continuum for each competency broken down into multiple skills, each with indicators that describe increasing rigor for progressing performance levels. Students move along the continuum demonstrating proficiency for a particular performance level over multiple instances. Advisory is a centerpiece to the Core Project model that is built around actively fostering a sense of community and support for students over four years in high school. Authenticity is central to The Core Project learning model as studios are centered around an essential question that drives a performance-based assessment and extends to an impact experience. Studio Guides, templates, and the continua are all scaffolds that support student agency in learning.

Many prevalent themes emerged from the data. A complex dynamic of *push and pull* was found between how teachers viewed competencies in relation to content and to project-based learning. An important finding was a mindset amongst teachers that first and foremost valued larger aims of empowering students and essential discipline themes, and used the competencies as a tool to accomplish this goal. Teachers shared the competencies: helped hone their practice; shifted their mindset to that of a facilitator; were a helpful tool for coaching students in multiple ways; forced them to improve in teaching skills; and promoted a commitment to literacy. Instruction involved preparation of scaffolds for agency and resources to provide choice and differentiation. A picture of a workshop atmosphere was developed for a typical day as students have independent goals and work in collaborative, differentiated groups. Teacher-centered professional development is highly valued at The Core Project, highlighted by collaborative norming and the use of teacher competencies. Lastly, notable challenges for The Core Project

include fidelity, mismatch between competencies and state mandates, and communication with students and parents.

Chapter V: Discussion

Introduction

The purpose of this study was to explore skill-based, transdisciplinary competencies and their influence on teacher practice. In the previous chapter, findings were presented that addressed the research questions: (1) *How are competencies employed?;* (2) *How do competencies influence teacher practice?*; and (3) *What are challenges experienced related to competencies and the competency-based model in general*? The majority of the chapter is organized by what the author deems are the most important implications of the findings and are discussed in relation to the existing research. These implications include: (1) increasing teacher capacity for competency-based education, (2) developing structures to support authenticity and agency, (3) using competencies as proficiencies and as a tool for teaching, (4) topics related to curriculum and instruction, (5) incorporating SEL, (6) discussion related to identified challenges, and (7) presenting system-wide structures that may better support competency-based education at scale. This chapter concludes by discussing areas of future research around competency-based education.

Discussion and Implications of Findings

Develop Teacher Capacity

Developing teachers' professional practice is absolutely essential to realizing competency-based education (Bingham et al., 2018; Casey, 2018; Gross & DeArmond, 2018; Scheopner Torres et al., 2018; Shakman et al., 2018; Toland, 2017). This position is highlighted by repeating a Core Project leader's assertion from the findings: "take the learning and growth and development of your adults as seriously as you take the growth and development of your kids." Complementing this stance is the viewpoint that the focus of teacher development should

not be on improving teachers, but rather on improving the practice of teaching. For instance, educational researcher James Hiebert states: "We tend to think that improving education is about improving teachers, recruiting better ones, firing bad ones. Improving teaching, it's a very different idea" (*A Different Approach to Teacher Learning*, 2015). Improving teaching involves continuously strengthening teacher capacity for effective instruction and creating learner-centered, collaborative, professional communities that drive personal and collective improvement in practice (Casey, 2018).

To support professional development for competency-based education, this paper advocates for effective PLCs that can provide a consistent structure for teachers' collective development. From this foundation, professional development should prioritize (a) beliefs, (b) developing enduring understandings, and (c) designing and norming performance tasks. Finally, professional development should be structured and sustained around a research-based, learner-centered competency-based framework.

Professional Learning Communities. In general, collaboration has been a particular characteristic or outcome of several competency-based education case studies (Basham, Hall, Carter, et al., 2016; Philhower, 2017; Toland, 2017), and has long been established as a factor for enhancing school effectiveness (Muijs & Harris, 2003). A specific structure for collaboration in education worth focusing on are *professional learning communities* (PLCs). PLCs are teams of educators who meet frequently to share expertise, plan instruction, review student work, and collaborate to improve their teaching practice and student academic performance (Friesen, 2019). In assessing the presence of competency-based practices in Northeast high schools, Evans and colleagues (2019) found that although structures such as flexible pacing and assessments were not widely reported by principals, PLCs were the most reported structure (4.01 / 5 on Likert

scale). As a result, the researchers conclude that PLCs can provide a foundation for building the capacity for more extensive whole-school reform (Evans et al., 2019). In addition, Casey and Sturgis identify PLCs as a structure to nurture a culture of learning to advance effective methods around competency-based education (Casey & Sturgis, 2018).

PLCs were highly valued by the Core Project and strongly supported the growth of teachers' practice over the years in implementing the competency-based model. The concept of PLCs stems from Peter Senge's (2010) application of systems theory in which he advocates for learning organizations that deliberately promote a culture of learning to evolve to dynamic changes. PLCs are widely considered a *best practice* in education, as a large body of research supports their positive impact on student achievement, higher expectations for students, classroom pedagogy, collective self-efficacy, and overall capability in developing teachers and sustaining school reform (DuFour & Fullan, 2013; Vescio et al., 2008; Voelkel & Chrispeels, 2017). However, "using the term PLC does not demonstrate that a learning community, in fact, exists" (Vescio et al., 2008, p. 2). For instance, in Vescio and colleagues' (2008) review of literature, schools where teachers worked together but were not deliberately focused on student learning did not see similar gains compared to PLCs that were. Thus, PLCs can provide a foundation for tackling more challenging components of competency-based education, but need to deliberately focus on student learning (DuFour & Fullan, 2013; Vescio et al., 2008) through *collective learning* and *shared personal practice* (Ning et al., 2015).

Beliefs. Adherence to The Core Project learning model was reportedly lacking for some teachers, and was even challenging for teachers that strongly advocated the learning model. Prior studies have demonstrated that despite schools employing some degree of competency-based features, traditional structures and teaching methods can still be prevalent (Gross & DeArmond,

2018; Shakman et al., 2018). Expanding to the greater history of education reform, even with supportive policies, reforms that attempt to reconfigure teaching, learning, and engrained school structures have typically resulted in a hybrid approach, where teachers tend to pick and choose different approaches that best fit their current practices but do not fundamentally change their practice as the reforms intend (Evans et al., 2019; Tyack & Cuban, 1995).

The findings of this study illustrate the importance of teachers' normative beliefs in shifting towards the implementation of competency-based education. Core Project leaders explained that fidelity was difficult to realize largely in part due to the difficulty of shifting prior beliefs to a new paradigm of education, a theme repeatedly found and expressed within the literature (Evans et al., 2019; Scheopner Torres et al., 2018; Shakman et al., 2018; S. C. Sullivan, 2016; Toland, 2017). This challenge was also highlighted in the findings by the Core Project's challenging, yet productive summer professional development where teachers reexamined their beliefs and practices around teaching and learning.

Prioritizing shifting teacher and other stakeholder beliefs is a key lever to realizing competency-based education (Philhower, 2017; S. Ryan & Cox, 2017; Scheopner Torres et al., 2018; Shakman et al., 2018; Toland, 2017). School leaders often focus on changing the immediate structures and practices without examining beliefs or political factors (Scheopner Torres et al., 2018; Senge, 2010; Welner, 2001). Multiple theories of change, although using varying terms, emphasize beliefs (also called normative factors or mental models) as the underlying driver in changing existing structures and practices (Philhower, 2017; Scheopner Torres et al., 2018; Senge, 2010). Further, policy changes, while necessary, have shown to be insufficient in achieving competency-based practices (Evans et al., 2019; S. Ryan & Cox, 2017;

Shakman et al., 2018). Therefore, addressing teacher beliefs is paramount to achieving successful implementation of competency-based education.

Developing collective beliefs is a process that is achieved by teams continually engaging in dialogue (Senge, 2010), and it should focus on the *why* behind competency-based education. To provide clarity for the context of competency-based education, Figure 5.1 below includes potential shared beliefs (which I synthesized from the findings and research) that can support competency-based education.

Beliefs to Support Competency-Based Education Implementation	
Traditional grades are flawed	Education should foster students' agency
All students can be successful	Learning and assessment should be authentic
Students learn at differing rates	Assessment should propel learning forward
Students learn in different ways	Students should develop fluency of content over memorization of content
Students benefit from having a meaningful relationship with an adult at school	Students' unique backgrounds and cultures should be invited into the classroom.
Educational structures and practices should pursue equity	Schools should explicitly foster students' social and emotional competencies
Transferable skills, rather than content, are most important for students to learn	Students should develop fluency of content over memorization of content

Figure 5.1. Potential Shared Beliefs to Support CBE Implementation

In addressing beliefs, The Core Project leaders discussed particular success in two activities. In one instance, teachers collaborated to create their own continuum for different performance levels for the skill of dribbling a basketball. In another activity, teachers used the continuum for the competency of *Presenting* to assess a video of a student's presentation. Both examples are intended to create dissonance concerning traditional methods of assessing in order to begin dialogue amongst teachers around new approaches. Overall, administrators and teacher

leaders can provide the time and space for dialogue and create experiences to structure discussion around beliefs that support competency-based education so learning communities can generate for themselves the *why* behind the work.

Enduring Understandings and Aims. This study aimed to investigate a school that placed considerable emphasis on the fifth tenet of competency-based education, the authentic application of knowledge. The findings related to this pillar demonstrated a consistent mindset amongst educators of valuing larger aims for their course and students. This view fits closely with the Understanding by Design (UbD) framework, particularly that of *enduring understandings*. UbD, is a framework developed by Grant Wiggins and Jay McTighe (2001) for designing curriculum through *backwards design* that includes: (1) identifying enduring understandings, (2) determining acceptable evidence, and (3) planning learning experiences. The enduring understandings refer to the big ideas and skills educators want students to be able to do and take away from their course; these were what that Core Project educators valued so highly. Although the UbD framework is widely known in education circles, from professional teaching experience, I argue that when backwards design is employed, inadequate attention is given to, stage 1 – developing enduring understandings. Educators typically start with, or quickly move to assessments (stage 2) for a unit defined by content (i.e. The *Civil War Unit* or the *Genetics Unit*) and plan learning activities backward from these (stage 3). Planning lessons backwards from assessments is part of the UbD framework, but the framework demands that enduring understandings direct these subsequent steps. It is for this reason that the mindsets of teachers at the Core Project stood out as one of, if not the most, important finding from the data. Furthermore, the perspectives of the educators at The Core Project demonstrate that enduring understanding can involve considering even broader overarching aims that may include

discussing to what extent educators intend for their school or class to encourage critical conscientiousness, self-understanding, agency, and readiness of for college (Noddings, 2013)

In Toland's (2017) phenomenological case study, enduring understandings (although she refers to them as *distilled learning targets*) drove teachers' decisions for creating skill-based standards and what content to include in the curriculum. In addition, similar to teachers at The Core Project, teachers in Toland's study emphasized that the work takes years to develop because distilling and deciding what is most important for a subject is inherently complex even for veterans because it requires changing beliefs and new teacher roles (Toland, 2017).

I advocate for designing learning experiences around enduring understandings and overarching aims to ensure the authentic application of knowledge and transformational aims of competency-based education. Creating systems that ensure students advance on mastery is a noble endeavor but can fall short by only allowing for success along a narrow range of traditional standards. For instance, although personalized online learning programs "meet students where they are academically, [students] are ultimately all going to the same place" (Schaef, 2016). Further, Toland states, "[competency-based education] asks learners to learn more deeply and in ways that are not necessarily easily reflected through traditional assessment and standardized testing" (Toland, 2017, p. 123). Thus, competency-based education cannot be simply a more efficient system that fits the traditional educational model. Rather, it should transform the nature of learning and the practice of teaching in schools (Rudenstine et al., 2018; Scheopner Torres et al., 2018; Sturgis & Casey, 2018; S. C. Sullivan, 2016; Toland, 2017). Similarly, Toland argues:

> The central feature of [competency-based education] should be made clear to be what really matters beyond teaching. What matters for students to participate in a globalized

> world filled with possible choices about how to treat themselves, each other, and the planet? (Toland, 2017, p. 121)

Thus, curriculum requires explicit reform and discussion around enduring understandings and overarching aims to meet these ambitious goals.

Norming Performance-Based Assessments. Norming and creating performance tasks within PLCs are recommended to collectively center and improve teacher instruction in giving feedback to students. A teacher's role in competency-based education necessitates a facilitatory role (Rudenstine et al., 2018; Sturgis & Casey, 2018; S. C. Sullivan, 2016; Toland, 2017). Additionally, in their book on proficiency-based assessment, Gobble and colleagues (2016) strongly emphasize that learning *is* reflection and that instructional time should be allocated accordingly by flipping the typical allotment of 80% instruction, 20% reflection and feedback to 80% reflection and feedback, 20% instruction. Norming student work on and creating performance tasks can support this change in mindset and instruction. For instance, a Core Project leader emphasized norming was the most important professional development teachers could engage in, stating, "[Norming] focuses most, if not all your time on giving feedback to kids to revise their work." However, facilitatory teaching methods are likely to be less familiar to teachers compared to more direct instruction methods (Shakman et al., 2018; Tyack & Cuban, 1995). Thus, the discussions that arise around norming or creating performance tasks in PLCs can assist teachers in explicitly using the continuum in instruction and feedback and collectively co-constructing and innovating best-practices in a competency-based model.

Competency-based, Research-based Professional Development. Addressing beliefs, enduring understandings, and norming performance tasks in PLCs are encouraged, but to sustain and fully support teacher capacity, a competency-based framework built upon the learning sciences and best practices of professional development is strongly endorsed.

The design behind The Core Project's professional development model was competency-based, but systems and structures to support the model appeared to be early in development. Limited data was collected on teacher experience with professional development, but conversations with Core Project leaders indicate promising initial results that require further exploration. Although data on teacher experience was not established in this study, the architecture of this professional development is still worth discussing alongside the literature.

In addition to PLCs and norming, the teacher competencies were identified as an important component of The Core Project professional development model. Competency-based frameworks, or teacher competencies, are imperative to define what the changing teacher role encompasses in a competency-based system (Casey, 2018). The Core Project teacher competencies helped define this changing professional role by stressing a commitment to: *(1) Building Relationships,* (2) *Personal and Professional Growth,* (3) *Designing for Authentic Project-Based experiences, and* (4) *Using the Student Continua in Planning Instruction and Providing feedback*.

Framed by teacher competencies, professional development should be organized so teachers experience and continue learning just as their students would experience competency-based education. Teachers, like their students, should progress based on providing evidence of having met the indicators of teacher competencies rather than on seat time of having attended a workshop. (Casey, 2018). At The Core Project, teachers were encouraged to use the

competencies, not as an evaluative measure, but as a tool to personalize and self-direct their learning. Although data was not collected on how teachers engaged with the competencies, having the autonomy, purpose, and ability to develop competence is predicted to be intrinsically motivating for teachers (R. M. Ryan & Deci, 2012), fosters personal mastery essential to learning organizations (Senge, 2010), and honors the expertise and profession of teaching. Next, competency-based professional development can allow teachers to directly experience the authenticity and agency of the competency-based model, which can aid teachers in generating for themselves a need for a new educational paradigm. Furthermore, by experiencing the learning model, teachers would be more able to design effective competency-based curriculum and anticipate areas in the learning process where students will likely require support.

Competency-based professional development should also be informed by existing research on professional development. A comprehensive study by TNTP, called *The Mirage* (2015), examined over one hundred school districts and found schools spent on average over $18,000 per teacher on professional development with no overall change to student achievement or improvement in teacher practices. Lack of improvement was attributed to *drive by* instruction that consisted of *sit and get* presentations or workshops that rarely involved follow-up and feedback ("The Mirage," 2015). Similarly, in a case study by Ermeling (2010), a group of science teachers participated in extensive professional development with experts on Inquiry Learning Theory, observing model lessons and writing their own curriculum together. Despite all of the groundwork, initial implementation was unsuccessful and messy (Ermeling, 2010). Instead, professional development that is sustained and embedded in teachers' day-to-day work and allows teachers to engage in their own revisions cycles is likely to produce the largest changes in practice. For instance, Corcoran and colleagues (2003) found teachers were

significantly more likely to use more reform-based teaching practices after 80 hours of aligned professional development, and DeMonte (2013) and colleagues found that the study with the largest effect size on student achievement involved 60 hours of professional development over a six-months period. Moreover, Gulamhussein (2013) states that teachers require at least 20 repetitions to fully master and integrate a new skill.

Guskey (2002) indicates that teachers' underlying mental models are not likely to change unless success of new practices are observed in the classroom, which, as prior studies reveal, is unlikely due to the need for continual iterations to achieve competence. Therefore, as vicarious success can increase self-efficacy (Bandura, 2010), it is recommended that teachers observe others (Elmore & Burney, 1997) that have expertise in certain teacher competencies or through potential videos in online communities. Other productive elements in implementation-centered professional development include effective feedback from coaches and collaboration with colleagues (DeMonte, 2013), further supporting the importance for PLCs in professional development.

In a competency-based professional development model, teachers exhibit choice to personalize and self-direct *anytime, anywhere learning*, and apply their learning to day-to-day practice through their own revision cycles (Casey, 2018). This framework deliberately promotes the evidence-based strategy of sustaining professional development through embedded practice (Corcoran et al., 2003; DeMonte, 2013; Ermeling, 2010; Gulamhussein, 2013; Sturgis & Casey, 2018; "The Mirage," 2015). Schools need to make deliberate efforts to encourage the needed time, iterations, and feedback that the research demonstrates is necessary to change teaching practices.

Teacher-centered professional development is worth investing in. School districts can spend a significant amount of money on professional development to little avail ("The Mirage," 2015); however, considering teacher quality has shown to be the largest school-related factor on student achievement (Hanushek et al., 1998), investment in professional development is still argued for ("The Mirage," 2015). Research-based professional development can be more costly because of the many hours required, but school districts have been able to effectively prioritize this kind of professional development within their budget (Elmore & Burney, 1997; "The Mirage," 2015). Lastly, a more teacher-driven model may potentially reduce some costs because a learner-centered model would promote a more self-sustaining learning organization centered around distributive leadership that would likely reduce the need for costly outside professional development.

Structures to Support Authenticity and Agency.

If students are going explore authentic messy problems and have greater autonomy, appropriate structures need to be in place to support them (Rudenstine et al., 2018). A misconception amongst educators is that agency is given by the teacher as the ability for students to choose (Gross & DeArmond, 2018), when instead agency is the competency to execute a task when given choice (Rudenstine et al., 2018; Stixrud & Johnson, 2019). Like any competency, agency requires practice to develop in a course, multiple courses, and even years. By becoming more familiar with consistent support structures, students are likely to develop greater self-efficacy that can trigger a positive feedback loop to become even more independent in their agency to learn (Bandura, 2010; Casey & Sturgis, 2018; National Research Council (U.S.) et al., 1999). Indeed, Core Project teachers confirmed students became more familiar, confident, and competent in their agency as they progressed in their high school careers. Several structures from

the findings – performance tasks, studio guides, performance task guides, literacy learning activities, and the continua itself, offer tangible models for educators to support a more-authentic and agentic paradigm of learning.

Performance Tasks. Performance tasks encourage project-based learning, and more closely resemble what students will do as citizens or in their careers (Condliffe, 2017; Villarroel et al., 2018). Performance tasks establish a relatively high degree of rigor as they require the highest levels of Bloom's taxonomy (B. Bloom, 1956). Authenticity is furthered when the performance task invites students to genuinely apply their work to their life and community (Casey & Sturgis, 2018; Peoples & Foster, 2019).

Studio Guides. Studio guides provide a new and encouraging authentic approach to introducing and structuring learning that can support agency. Outside the school building or after formal education, learning does not occur in a prescribed linear fashion. Rather, people learn information and skills by asking questions and using their agency to seek out resources, engage in dialogue, reflect, and prototype. The studio guide reflects this more organic process of learning, as resources can curated via a *Google Site*, *Google Slide*, or *Miro Board*. Further, providing more authentic resources provides a learning environment for students to develop their competence in the crucial skill of critically evaluating sources (NGSS Lead States, 2013; Noddings, 2013; Wineburg & McGrew, 2017).

Teacher as facilitator is a role long been advocated (Dewey, 1938), but is more difficult to achieve in practice within the confines of traditional school structures (Tyack & Cuban, 1995). With students having resources and the framework that a studio guide provides, teachers can shift their mindset to how they can design learning experiences to support students in engaging in these resources to accomplish a performance task. Instead of learning characterized as a *slow*

*drip (*termed used in by Sydney Schaef in correspondence) where students are dependent on the teacher as gatekeeper to unveil the next droplet of information, studio guides provide students with a foundation of resources for them to utilize their agency.

As of the publishing of this study, ReDesign, an educational organization, is currently developing a digital marketplace of about 100 exploratory boards that are similar to the Core Project studio guides, that can provide tangible models to shift towards more authentic, student-driven competency-based education (*CoLab | ReDesign*, 2021).

Scaffolds for Agency. Additional structures that can help scaffold agency include performance task guides (what can be considered the *instructional guide* or *mini-book* for a competency), the exemplars within them, and learning activities to support students engaging in resources. These structures are all content-agnostic and therefore can be used across units of content, making prep work for teachers more manageable, sustainable, and collaborative.

Competencies. This study particularly focused on the influence of competencies, and these were identified as a substantial structure that can support authenticity in agency. Competencies were also found to have several other implications that require extensive examination and will therefore be discussed more fully in the following section.

Incorporate Competencies as Proficiencies and as a Tool for Teaching

At The Core Project schools, competencies were the graduation requirements and the benchmarks that student performance was rated on. Competencies were transdisciplinary skill-sets that described academic, social & emotional, and dispositional skills that could best be accomplished through performance tasks. Each competency was comprised of multiple skills and was expanded along a continuum of performance levels that described what mastery entailed at

each level of rigor. Students completed portfolios associated with each performance level like completing levels of a video game.

The findings of this study provide compelling reasons for schools to adopt skill-based, transdisciplinary competencies as both a tool for proficiency-based grading, and a tool to guide teaching. To support this recommendation, the multiple findings from this study on the implementation of competencies and their influence on teacher practice will be discussed. Competencies will first be analyzed around the working definition of competency-based education that includes: (1) students advance upon mastery rather than seat time, (2) learning objectives are explicit, measurable, and transferable, (3) rapid and differentiated support (4) assessment that propels learning, (5) and learning that is demonstrated through the authentic application of knowledge (Sturgis, Patrick, & Pettinger, 2011). Additional components will be discussed that emerged from the findings and include: (6) the dynamic between competencies and content (7) as well as project-based learning, (8) sharpening professional practice, (9) shifting the teaching role to facilitator, (10) and the overlap amongst disciplines.

Proficiency-based Assessment. Regarding the first tenet, the continua is a model of *proficiency-based assessment* that more closely aligns with the second principle of competency-based education compared to typical 4, 3, 2, 1 proficiencies used by most schools that currently employ proficiency-based grading. For typical 4, 3, 2, 1 proficiency-based assessment, proficiency is the same for a standard or grade level despite that a classroom is likely to have a range of students that are significantly behind, at, or above proficiency. Thus, what constitutes *proficiency* for these standards is ultimately arbitrary, ignoring where students are at prior to learning (Noddings, 2013; D. Ravitch, 2020). The continuum does not arbitrarily define proficiency, but rather simply indicates where students are currently at within a range of

performance levels. Indeed, The Core Project teachers discussed how the competencies assisted them meeting students where they were at.

Rapid and Differentiated Support. Similar to other case studies (Philhower, 2017; Shakman et al., 2018; S. C. Sullivan, 2016; Toland, 2017), although many creative strategies and structures were enacted by The Core Project teachers, the third principle, *rapid and differentiated support,* was a considerable challenge to implement. However, the continuum expanded possibilities for differentiation and flexible pacing. Although in theory students in a competency-based system can move on upon mastery, the reality of flexible pacing is still considerably limited in practice at competency-based schools (Evans et al., 2019; Scheopner Torres et al., 2018; Shakman et al., 2018). It is demanding for a teacher to cover different content simultaneously during a class. However, a continuum that prioritizes skills over content provides a new lens to approach accomplishing flexible pacing. Competencies repeat themselves throughout units and courses, so students that have advanced at different paces can receive differentiated instruction for the same competencies, while also keeping the overall content of the studio the same. In other words, the assembly line of topics may continue to move, but what is most valued and assessed on, the competencies, can move at the students' own pace. In addition, the findings indicate that teachers and students are likely to find moving from one performance level to the next more manageable and achievable, which can assist students that start at lower levels working to advance across multiple levels. A Hawkins teacher highlighted this point, explaining how the continuum is "more of a stepper" for students to progress.

In addition to flexibility in the classroom, Hill Valley High School was able to use the competency dashboard part of the schools Learning Management System (LMS) to identify performance levels students still needed to work on in other classes or from years prior, and

support students accordingly. Therefore, competencies that are transdisciplinary and understood by all educators can provide a foundation to innovate strongly needed, well-coordinated, system-wide rapid and differentiated support structures.

Although competencies can provide a structure more conducive for flexible pacing, despite a variety of encouraging strategies, differentiation was still reported to be a significant challenge at The Core Project. Simply stated, the rapid and differentiated support required by competency-based education cannot be accomplished by one classroom teacher. Thus, the continuum provides an encouraging framework for supporting flexible pacing, but it is vital to acknowledge that new innovative school-wide differentiation support structures are still greatly needed.

Assessment That Moves Learning Forward. In addition to encouraging flexible pacing, the recurrence of competencies can facilitate the fourth tenet, *assessment that moves learning forward*. The competencies are content-agnostic skills that repeat themselves across disciplines and years, while standards are more content and discipline specific. Many times, standards are *one-and-done*. For example, the standard, *I can effectively model the reactants, products, and purpose of photosynthesis* would not likely be readdressed after proficiency is met (although the skill of modeling would!). The feedback students receive on performance tasks propel learning because competencies are readdressed in subsequent studios and other disciplines. Conversations with teachers supported this notion, as one teacher highlighted that although he provides revision opportunities for his students, he also emphasized students are encouraged to use the feedback on the continua to support the next studio they will engage in.

Authentic Application of Knowledge. Competencies encouraged the fifth principle, the authentic application of knowledge, as they are centered on skills that more closely align to 21st century educational aims and encourage performance tasks. It is widely agreed upon that students need to critically think and employ skills to participate in today's modern democracy and economy (Gilbert, 2005; Noddings, 2013; Schaef, 2016; Wagner & Dintersmith, 2015; Wright, 2018). Yet, traditional grading practices rarely encourage or measure these factors (Noddings, 2013; O'Connor, 2011). The Core Project competencies required proficiency through authentic performance tasks, and teachers confirmed that traditional assessments were not sufficient tasks to assess students along the continuum. Similar to how 4,3,2,1 proficiency-based grading can shift assessment from multiple choice to written assessments, competencies can advance assessments beyond traditional in-class tests to more authentic, applicative performance tasks. Thus, the competencies provide a needed example of proficiencies that are aligned to 21st century skills and encourage the authentic application of knowledge.

Competencies and Content. At The Core Project schools, a complex dynamic was found between how teachers viewed competencies in relation to content. Teachers engaged in critical conversations to determine which pieces of content were needed in relation to enduring understandings and the competencies. Toland states a similar finding in her phenomenological case study in which teachers undertook painstaking work for distilling learning goals to specify and clarify the content and skills within the curriculum. McTighe and Wiggins (2001) argue distilling content is vital for curriculum design because coverage does not equate with learning. They contend that deeper learning ironically leads to greater, more efficient learning. The work of transitioning to a competency-based curriculum will require educators with *professional ethics*

(termed by a Core Project teacher) that can develop curriculum that explores competencies around disciplinary core ideas.

Continuing with the dynamic between competencies and content, fluency was valued over memorization at The Core Project. This belief is widely accepted in conversations around learning that aligns with 21st century needs. For instance, Wagner and Dintersmith assert that recalling information is obsolete in today's world with the ability to google facts (Wagner & Dintersmith, 2015). Gilbert (2005) characterizes knowledge in the Industrial Age as a *stuff*, while today knowledge is better characterized as a *verb* and *a process* of utilizing information. Research in the learning sciences (Casey & Sturgis, 2018; National Research Council (U.S.) et al., 1999) emphasizes that in order develop competence, students must have a deep foundation of factual knowledge. However, facts and ideas should be understood in a contextual framework, and this knowledge should be organized in ways to promote retrieval and application. In other words, having foundational knowledge does not solely involve memorizing and recalling information, but also pertains to fluency in relating facts together and being able to organize one's resources to utilize information at the proper moment.

There were specific structures found at The Core Project schools that show promise in supporting content fluency. First, the competencies such as *Conducting Research* can help students investigating topics, build knowledge, and integrate information. Second, the scaffolds for agency, called *learning activities,* can give students specific literacy guidance in reading, processing, summarizing, organizing, and retrieving information. Third, some teachers discussed how the notes students generate from learning activities could be accessed on check-for-understanding quizzes and when completing performance tasks.

Competencies and Project-based Learning. The philosophy behind project-based learning aligns strongly with a student-centered, democratic philosophy worth pursuing (Dewey, 1916; Noddings, 2013). At The Core Project schools, the competencies both grounded and supported project-based learning. Core Project leaders discussed that although project-based learning provides authenticity, in practice its open-ended nature may make it difficult to ensure learning of important skills and content. This statement is supported by the project-based literature that indicates an inconclusive range of academic rigor and academic outcomes (Condliffe, 2017). However, attempting to structure project-based learning with traditional content-heavy objectives, can take away from the authenticity of project-based learning. For instance, the literature indicates a current mismatch between traditional assessments, which strongly emphasize content objectives, and project-based learning. (Condliffe, 2017; Thomas, 2000).

Competencies may have success in grounding project-based learning because they are skills rather than content. Working to structure project-based learning with content is a greater *shift* and can sacrifice the authenticity central to project-based learning. Skills, however, are more related to what students are producing in project-based learning through performance tasks. Thus, competencies can provide structure to guide project-based learning while also maintaining much of the authenticity that is appealing to this educational model. This argument is visualized in Figure 5.2 below.

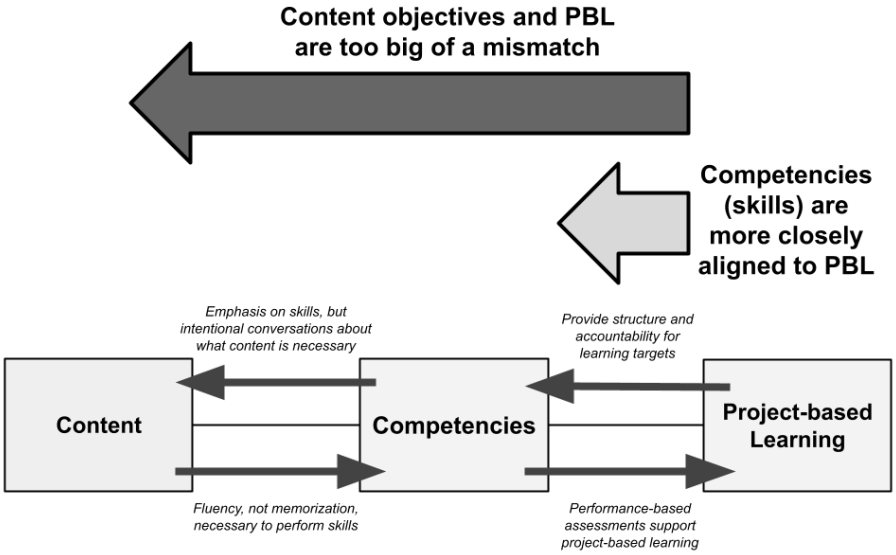

Figure 5.2. Content Objectives and PBL Too Big of a Mismatch.

Further, as demonstrated in the findings, competencies can also propel project-based learning. Core Project teachers spoke to how the competencies required them to shift their practice and curriculum design to require performance tasks for assessments, which naturally encouraged more authentic learning experiences and project-based studios (units). Indeed, in the literature, performance tasks are the recommended mode of assessment to address the mismatch found between traditional assessment modes and project-based learning (Condliffe, 2017). In addition, another significant challenge to project-based learning has been developing a coherent curriculum rather than having stand-alone units that fit into the existing curriculum (Condliffe, 2017; Shwartz et al., 2008). The Core Project competencies were the sole criteria which students were assessed upon, not just in a school year but throughout their high school career; this can provide considerable coherence for project-based learning. Overall, competencies show promise in providing a conducive structure for project-based learning.

Honing practice. A finding that appears new in the competency-based literature is that teachers *consistently* discussed how the competencies helped sharpen or hone their teaching practice. Many teachers reported that a breakthrough in their practice in teaching in a competency-based system emerged when they used the competencies to direct their work. Specifically, the continuum provided a structure for designing lessons, a benchmark for fully addressing skills, and the organization to give clear feedback. Thus, competencies can provide a needed foundational structure to guide teacher practice in the less linear and more dynamic and flexible learning environments required for competency-based education.

Teacher as Facilitator. All teachers at The Core Project reported their role and mindset had shifted to that of facilitator, which is highly consistent with teachers' experience in competency-based education (Philhower, 2017; Sullivan & Downey, 2015; Sullivan, 2016; Toland, 2017). Similar to Toland's case study (2017), over time Core Project teachers increasingly shifted their practice to explicitly teach skills. Such a focus makes sense considering the adage *what gets measured gets done*. Notable in this case study as well as Toland's was the long, difficult, collaborative, and iterative process of switching to the mode of teaching skills from more traditional methods. Thus, competencies show promise in supporting more student-centered, facilitatory teaching practices, but educators should recognize that this transition is a process that requires, as a Core Project teacher stated, "time to experiment with." (S. Sullivan & Downey, 2015; Toland, 2017).

Blurring Disciplines. A unique finding from this study that was facilitated by the competencies included the blurring of disciplines. For instance, teachers would pull from a range of competencies that were non-academic or traditionally associated with another discipline to fit the needs of a performance task for their studio. Experiencing competencies in different subjects

can unify core skills rather than reducing, separating, and compartmentalizing knowledge. In addition, engaging in competencies across disciplines provides consistent exposure to and reinforcement of skills, while revealing nuances to each field. Teaching competencies across disciplines also appeared to enhance collaboration because educators across disciplines could share insight and share resources.

In using competencies across disciplines, a particular emphasis was placed on literacy as many teachers across disciplines utilized English Language Arts (ELA) competencies. In addition, within the artifacts, other scaffolds for agency organized literacy strategies to help students preview, process, and summarize resources. In a RAND Corporation report on adolescent literacy, McCombs and colleagues (2005) found middle and high school literacy development to be the most neglected in classroom instruction. Further, Buehl (2017) argues it is generally believed that when most students learn to read around 3rd grade, they will be able to read to learn. However, there are important strategies required to navigate complex, discipline-specific texts (Buehl, 2017; Paparo & Botel, 2016). Thus, consistent use of ELA competencies (and literacy scaffolds) across disciplines provides an encouraging foundation for supporting literacy school-wide.

Learning Model & Instruction

In this section, (1) The Core Project learning model will be analyzed through the learning sciences, (2) competency-based education will be discussed in relation to other reform efforts, and (3) teacher instruction will be examined.

The Learning Model. In their paper *Quality Principles of Competency-Based Design*, Sturgis and Casey (2018) stress the importance of basing competency-based curriculum design and pedagogy on sound research in the learning sciences, and synthesize the leading

psychological research around learning. Considering that many traditional schooling structures do not align with these learning theories (Rudenstine et al., 2018), it is useful to evaluate The Core Project learning model alongside the current research on learning.

The Core Project learning model aligned to the learning sciences in how it provided relevance and choice to students. All studios reviewed in this study explored current problems that frequently related to direct engagement in, and impact on, the students' lives and community. It is fairly evident that students are motivated and more inclined to learn from contexts that are relevant and they personally value (Toshalis & Nakkula, 2012). This practice is further ensured when teachers provide students with choice to bring in their unique background and areas of interest to decide how they will explore the essential question and accomplish the performance task(s). Further, encouraging autonomy and choice is intrinsically motivating (Pink, 2009; R. M. Ryan & Deci, 2012) and provides the opportunity to develop competency in practicing agency (Stixrud & Johnson, 2019). Lastly, choice also allows for a diverse group of students to find personal value in a common topic, thus supporting culturally relevant and sustaining pedagogy (Peoples & Foster, 2019).

The scaffolds for learning align with several theories on cognition, motivation, and self-efficacy. A continuum of performance levels, when compared to a shared, arbitrary standard can better meet students at their individual zones of proximal development – pushing students to just manageable difficulties that promote optimal learning (Csikszentmihalyi, 2014; Pink, 2009; Vygotsky & Cole, 1978). Extensive research on incremental successes has shown to generate positive feedback loops of further motivation and enhanced self-efficacy (Bandura, 2010; Toshalis & Nakkula, 2012) which the *step-like* performance levels of the continuum have promise in fostering. Lastly, learning does not occur in predicted linear patterns and can take

multiple years to building competency and a rich knowledge-base (Casey & Sturgis, 2018; National Research Council (U.S.) et al., 1999; Noddings, 2013; Hanna, David, & Fransisco, 2010). Thus, the regular and familiar scaffolds for agency can support automaticity in the competencies over time.

The learning sciences also highlight the importance of social learning, which was prevalent at The Core Project. There is legitimate concern that certain types of blended or personalized learning will ultimately lead to an Orwellian dystopia of students individually being fed information on laptops the majority of the school day (Herold, 2017; D. Ravitch, 2020). It is important to recognize that learning is an inherently social process where students need to interact with peers and adults to collectively co-construct knowledge and develop social skills (Casey & Sturgis, 2018; Vygotsky & Cole, 1978). Furthermore, social learning is essential for participatory democratic education (Dewey, 1986; Noddings, 2013). The Core Project learning model, although designed to meet students' individual proficiencies, also acknowledged the social nature of learning. The launch phase was designed to give students a collective experience, purpose, and provide collective background knowledge. Throughout a studio, although Core Project teachers use multiple learning structures, cooperative learning was reported as one of the most widely used methods in the classroom. Moreover, students usually participate or experience the culmination of learning, the impact experience, together. Finally, relationships were one of the most important of the Core Project's core values. Overall, the Core Project learning model appeared to assess students on their individual competencies while also incorporating and encouraging collective and cooperative learning.

The Intersection of Multiple Education Reforms. The central premise of competency-based education is strikingly simple: students progress based on mastery (not seat time). However, the intended goals are profoundly transformational and far-reaching (Rudenstine et al., 2018; Sturgis & Casey, 2018). Consequently, many reforms intersect with competency-based education – such as deeper learning, student-centered learning, personalized learning (Evans et al., 2019; Sturgis & Casey, 2018). James Rickabaugh, director of the Institute for Personalized Learning, captures the complexity and interconnectedness of the many educational fields of interest that competency-based education strives for in his honeycomb model, although he uses the term personalized learning. (Figure 5.2)

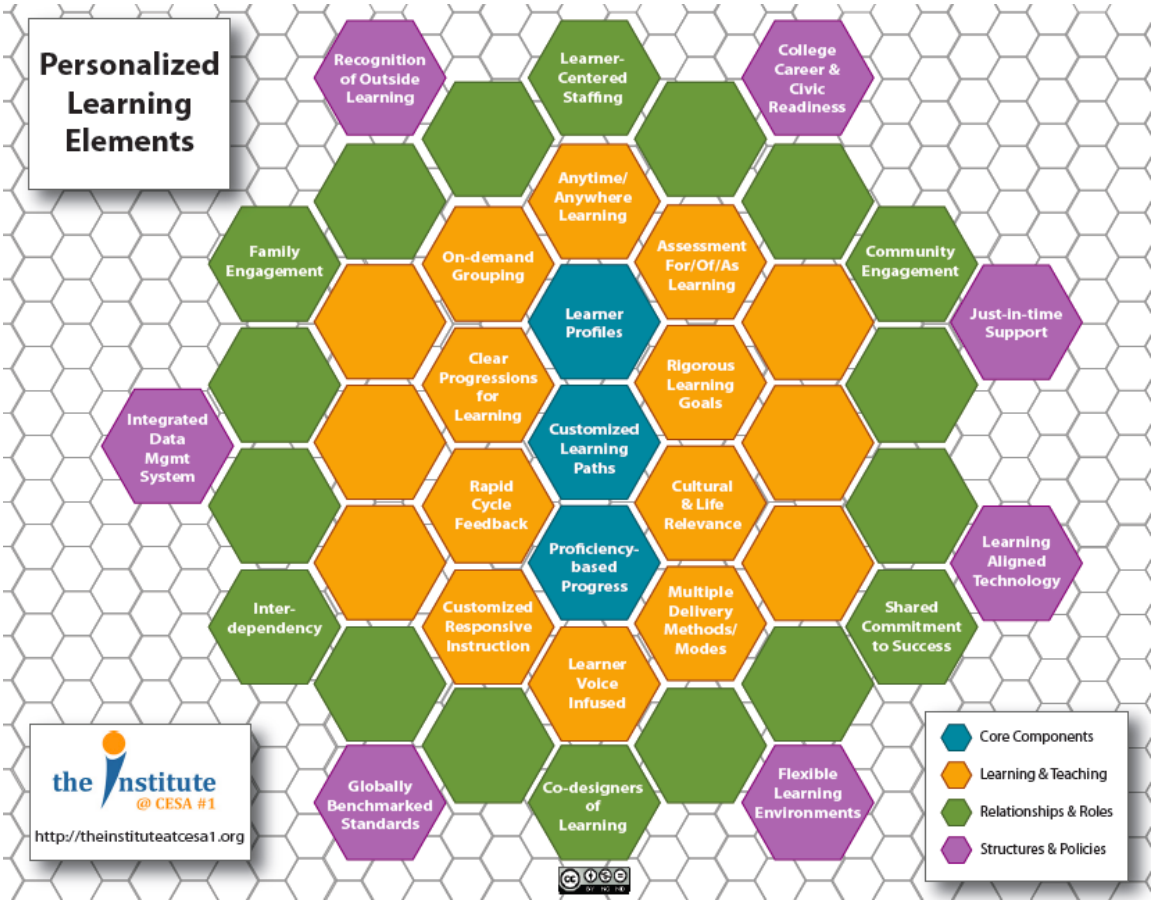

Figure 5.3. Honeycomb Model (Rickabaugh, 2016)

The honeycomb model is not as succinct as the more extensively cited five-component competency-based education definition utilized in this paper (Sturgis, Patrick, Pettinger, 2011), but has the advantage of illustrating how multiple educational structures and fields are explicitly intended to mutually reinforce one another in competency-based education. The Core Project's educational model was not directly framed by the honeycomb model, but a strong alignment exists between the two.

Despite the coupling of competency-based education with many education endeavors, I argue that these fields would benefit connecting to competency-based research in their respective fields. Fields such as project-based learning, social and emotional learning, and service learning are sometimes mentioned or implied in the competency-based literature, but in their individual, respective fields, there is virtually no awareness of competency-based education. Explicit efforts should be made in both school implementation and in educational research to encourage the mutual reinforcement of competency-based education with these educational initiatives.

Service Learning. Continuing discussion on interconnecting numerous educational initiatives, service learning is an educational approach that can mutually support competency-based education (Sturgis & Casey, 2018). Service learning is an academic approach that combines academic learning with community service. However, service-learning specifically balances between doing service and gaining skills as an academic learner, includes critical reflection, and ensures that the needs of the community are defined by the community (Jacoby, 2014). A metanalysis of 62 studies that included a total of 11,837 students by Celio, Durlak, and Dymnicki (2011) illustrates that students that engaged in service learning showed significantly positive increases in attitudes toward self (ES = 0.28), attitudes towards school and learning (0.28), civic engagement (0.27), social skills (0.30), and academic achievement (0.43). In

addition, these outcomes were higher when measures that indicated greater fidelity were also higher.

Service learning can support competency-based education as it aligns with the fifth competency-based principle, the authentic application of learning (Sturgis, Patrick, Pettinger, 2011), and encourages pro-social, community-integrated, democratic learning experiences (Noddings, 2013; Rickabaugh, 2016; Sturgis & Casey, 2018). However, a challenge to service learning has been finding the *sweet spot* between accomplishing sufficient academic learning and meaningful community service (Jacoby, 2014). Although academic content can be challenging to pair with community service, content-agnostic, transdisciplinary competencies such as the Core Project's *Project Quality* and *Collaboration*, and South Carolina's preliminary competencies – *Leading Teams*, *Engage as a Citizen*, and *Developing Networks* (*SC Competencies & Level Sets*, 2019) – align well with engaging students in community service. Overall, more authentic entrepreneurial and service-learning projects (Sturgis & Casey, 2018) are conceivable and achievable when proficiencies are competencies that expand beyond narrow academic content.

A school called One-Stone has an extra-curricular program named *Project Good*, which does not itself utilize competencies but is a helpful model for service learning. *Project Good* uses a *Design Thinking* framework and establishes that the needs of the community are met by the community: https://onestone.org/project-good-1 (*Project Good*, 2021). This model can be helpful for competency-based schools aiming to incorporate service-learning into the in-school curriculum. In addition, the *Design Thinking* framework of *Project Good* itself could be supported by the incorporation of dispositional and SEL-related competencies.

In this section, I argued that competency-based education should be more explicitly connected in practice and research to service-learning, project-based learning, and SEL. I then

elaborated on service-learning. Project-based learning and SEL are elaborated upon in this paper, but not in this section. Project-based learning was discussed in the section *The Influence of Competencies* under the subsection *Competencies and Project-Based Learning*. SEL will be discussed in greater detail in the section titled: *SEL and CBE as Mutually Supporting Systems.*

Instruction. Instruction for Core Project teachers involved substantial preparation of resources to provide choice and differentiation. Such findings were expected and consistent with other case studies that showed teachers prepared large amounts of upfront work and continually revised their curriculum (Bingham et al., 2018; Carlyle, 2018; Toland, 2017). Curating quality, appropriate resources is an essential component of competency-based teaching and supports students in developing agency (Rickabaugh, 2016). Teachers in competency-based systems should develop competency in selecting content resources that are diverse, culturally relevant, and promote critical conscientiousness (*Learning as Inquiry*, 2021). The data of this study indicates an advantage of competencies in allowing teachers to collectively develop reusable resources around skills to make preparation more manageable, and providing more time for teachers to critically curate rich, content-related resources for a unit.

A Competency Works report by Antonia Rudenstine and colleagues (2018) establishes a *Ready, Set, Go* framework for how a typical class might function in a competency-based system, but specific instructional models are limited in the literature. This study adds to the literature a tangible model for how lessons can be structured by teachers in a competency-based classroom. The findings of this study revealed a *workshop* type of atmosphere that closely aligns to the *Ready, Set, Go* framework (Rudenstine et al., 2018). For instance, Step 1, *Ready* refers to the flexible, spaces, furniture, resources, and routines that allow for multiple modes of learning. Core Project teachers described frequently changing the classroom set-up to fit the needs for the day,

emphasized the importance of having everything ready to go so students could direct their learning, and pre-made resources and scaffolds for students to pull from.

Step 2, *Set*, involves the teacher creating student grouping based on individual student needs. For The Core Project teachers, formative assessment significantly drove planning instruction. As one teacher explained, "Your mindset changes, because your job is to always assess." Core Project teachers would put considerable time and effort into analyzing the competency dashboard (part of the LMS), formative assessments such as *wrap-ups* or *exit slips*, and their own organization systems in order to plan instruction and form student groupings. The findings also provide more clarity on multiple grouping strategies that can be employed, such as groupings based on similar performance levels, varied performance levels, and even encouraging and guiding students in self-regulation to select activities that fit their current learning needs.

Step 3, *Go*, involves employing multiple modes for different groupings dependent on different learner needs. Core Project teachers spoke to using multiple teaching methods such as direct instruction, conferencing, cooperative learning, mini-lessons, etc. and how the classroom, "looks chaotic, but…isn't." Teachers also discussed the challenge of consistently and effectively employing multiple learning modes during lessons. Although this study supports and further illuminates this early competency-based instructional framework, further research and additional innovations are required.

SEL and CBE as Mutually Supporting Systems.

CASEL (The Collaborative for Academic, Social and Emotional Learning), the leading SEL organization, defines *social and emotion learning* (SEL) as:

> *"*the process through which all young people and adults acquire and apply knowledge, skills, and attitudes to develop healthy identities, manage emotions, and achieve personal

and collective goals, feel and show empathy for others, establish and maintain supportive relationships, and make responsible and caring decisions." (*Fundamentals of SEL*, 2021) This section will explore how the field of SEL and competency-based education are mutually supportive.

Although the specific use of the term *social and emotional learning* or *SEL* was not frequently noted in the data, the structures and practices uncovered in interviews and artifacts strongly aligned with CASEL's framework and competencies (Mahoney et al., 2020). As was found in Basham's (2016) mixed-method study, Core Project teachers found the need to support students in practicing self-regulation and agency in a more student-centered learning model. In addition, developing supportive relationships was identified in the data as one of, if not the most important, factor in realizing competency-based education; similar emphasis on relationships is echoed in studies by Toland (2017), Philhower (2017), Sullivan (2016) and Carlyle (2018).

Social and emotional learning (SEL) is important for academic success, well-being, and developing SEL competencies (Durlak et al., 2011; Taylor et al., 2017), and SEL competencies are linked to positive career, financial, and well-being measures in adulthood (Tough, 2013). In this section, I argue the importance of explicitly addressing SEL in competency-based education implementation to ensure success and equity, and also reciprocally argue that competency-based education (CBE) provides a holistic framework that can integrate SEL in academic settings.

SEL supporting CBE. Prioritizing SEL is imperative to support competency-based systems. First, SEL aligns with the aim of competency-based education to include and foster non-cognitive competencies that expand educational aims beyond narrow academic criteria that intends to develop the *whole child* (Rudenstine et al., 2018; Sturgis & Casey, 2018). Thus, SEL structures and practices can bolster this goal. Next, with more autonomy in a competency-based

system, students need explicit support in developing self-regulation skills such as self-awareness, self-management, and agency (Basham, Hall, Carter, et al., 2016; Lewis et al., 2014; Rudenstine et al., 2018; Scheopner Torres et al., 2018; Sturgis & Casey, 2018). Lastly, although competency-based education is frequently promoted for its potential for advancing equity (Rudenstine et al., 2018; Scheopner Torres et al., 2018), competency-based education also presents a danger of exacerbating existing inequities (Lewis et al., 2014). For instance, students from less advantaged backgrounds are likely to demonstrate lower levels of metacognition and self-regulation, skills required to succeed in a competency-based system, and there is concern that without proper equitable systems in place, these students will be further left behind. (Lewis et al., 2014; Scheopner Torres et al., 2018) Thus, providing equitable support for these skills through SEL is vital to ensure success and equity in competency-based education.

CBE Supporting SEL. A competency-based approach can provide a useful model for incorporating multiple SEL teaching practices. Moreover, additional structures were present at The Core Project that may further support SEL in the school and classroom; these include: the teacher competencies, advisory, and the student competencies.

Framework for Incorporating SEL Teaching Practices. Although many SEL programs exist, due to modest effect sizes, Jones & Bouffard (2012) recommend that classrooms and schools also integrate the teaching and reinforcement of SEL skills into their daily interactions and practice with students. This argument aligns with CASEL's framework that holds SEL should be ubiquitous within the classroom, school, and community (Mahoney et al., 2020). In establishing SEL aligned teaching practices, Yoder (2014) identifies incorporating classroom practices such as responsibility and choice, cooperative learning, classroom discussions, self-reflection, self-assessment, and competence building (modeling, practice, feedback, coaching).

In addition, Jagers (2019), advocates for project-based learning as an approach to foster SEL, especially for encouraging transformative SEL – a recent lens of SEL that is culturally sustaining, equitable, and acknowledges and empowers students to navigate the greater sociopolitical context. Project-based learning necessitates the use of SEL competencies to accomplish a project and provides an authentic context that can develop critical conscientious[4] through action-oriented projects (Jagers et al., 2019). Although competency-based education is not mentioned in the SEL literature, the classroom practices that the SEL literature recommends are all components of a well-designed competency-based education model.

Competency-based education can provide a framework to encourage SEL aligned teaching practices. In athletics, there are movements that require the complex coordination of a multitude of factors. Instead of reducing focus to each individual factor, good coaches tell athletes to concentrate on just a couple of points that cause the rest of the factors to uniformly coordinate together. Similarly, competency-based education is an educational approach that more easily encourages the integration of the separate educational practices recommended in the SEL literature. An authentic competency-based approach necessitates SEL aligned practices such as project-based learning, self-reflection, and responsibility and choice, providing opportunities to coordinate the explicit integration of SEL into teachers' daily practice.

Teacher Competencies. The teacher competencies provide a potential model for providing professional development around SEL. Creating capacity for teachers to develop SEL practices and to develop their own SEL competencies is critical for successful SEL implementation (Schonert-Reichl, 2019). The Core Project teacher competencies directly promoted these SEL factors. Three of the five teacher competencies included *Building*

[4] Critical conscientiousness refers to "the ability to recognize and analyze systems and commitment to take action against these systems" (El Amin, et al., 2017).

Relationships, Professional & Personal Growth, and Mentoring for Advisory. Further, skills within these teacher competencies included: *Value and practice culturally responsive teaching; Implement trauma-informed and restorative practices; Hold regular one-on-one conferences; Nurture trusting and meaningful relationships with students; and Build community and ownership*. Integrating SEL-related practices and competencies into a teacher-centered professional development framework has potential for incorporating SEL into standard teacher practice.

Advisory. Developing school structures to foster community and facilitate mentoring, such as an advisory period, should be considered for both academic and social and emotional learning. Almost all of the competency-based schools in the case studies reviewed incorporated advisories as key component to their model (FSG, 2019; Philhower, 2017; Shakman et al., 2018; S. C. Sullivan, 2016; Toland, 2017), and one Core Project leader asserted that competency-based education was simply not possible without advisories. Similar to other studies on competency-based education (Philhower, 2017; Shakman et al., 2018; Sullivan, 2016; Toland, 2017), an advisory served the purpose of (a) building relationships, (b) fostering non-academic competencies, and (c) overseeing students' holistic academic progress. This study adds, or at least emphasizes, the sense of community advisories can foster, providing students with a sense of belonging which is valuable in itself. The research also demonstrates a strong impact on academic performance (Farrington et al., 2015).

Considering the concern and challenge of assisting students, particularly marginalized and low-income students, in managing a more autonomous competency-based system (Lewis et al., 2014), the findings underscore the advantage of the advisory as a dependable structure that provides students with an educator to help them holistically manage academic progress.

Moreover, students that have at least one positive, strong adult-relationship have better academic and psychological outcomes (Ruus et al., 2007; National Scientific Council on the Developing Child, 2015). Although these relationships occur regularly in schools, educational systems, (specifically middle and secondary schools that have compartmentalized classes) are not explicitly designed to support such relationships, resulting in many students *slipping through the cracks*. Thus, school structures such as an advisory, that are solely dedicated to academic coaching and fostering community, are more likely to foster SEL and establish crucial mentor relationships for all students.

SEL Competencies. In addition to academic competencies, the Core Project included student competencies that addressed SEL and dispositional skills. First, these help equate the value of SEL competencies with academic competencies. Also, due to the reality that *what does not get addressed does not get assessed* (Schonert-Reichl, 2019), utilizing SEL competencies can help schools prioritize SEL. Just as it was found that the competencies assisted teachers in focusing on, breaking down, and teaching academic skills, SEL competencies can help teachers do the same with supporting students' social and emotional learning. This structure can be especially helpful considering that SEL is a relatively new movement, and concrete guidance is needed (Mahoney et al., 2020). Lastly, expanding to a transformative SEL mindset, it is recommended that schools include families in the conversation of modifying competencies that allow for culturally sustaining SEL (Mahoney et al., 2020).

Despite the promise of SEL-related competencies may have in supporting SEL and the strongly advocated use of assessing SEL competencies within the SEL field (Mahoney et al., 2020; McKown, 2019), caution should be taken concerning the extent of their use in assessment (McKown, 2019). For example, there are risks in placing onto students a valuation on elements

of themselves that are personal, dynamic, culturally-dependent, elusive to measure, and challenging to interpret (McKown, 2019). Nel Noddings speaks to this dilemma when discussing what she terms as promoting *moral* factors in education. She acknowledges the vital role education plays in developing the whole child but also recognizes the messiness and potential problems of explicitly reducing moral factors as though they are discrete academic objectives (Noddings, 2013). The Core Project *Personal Development Competencies,* which can be characterized as SEL competencies, were used only as a tool to guide student self-reflection and conferences, not to determine a grade or graduation requirement. In this mode, SEL competencies can provide teachers a frame of reference for incorporating social and emotional learning and guide students and teachers in supportive mentoring conversations.

As argued above, SEL competencies can help in incorporating as a reflective, mentoring tool, but without being explicitly assessed for a grade, the problem of *what gets measured, gets done* may still remain. A potential solution could be utilizing competencies that expand beyond traditional academics but also require significant social and emotional competence. For instance, The Core Project competencies such as *Collaboration*, *Project Quality* or the ReDesign competencies such as *Building Community*, *Learn Interdependently, Design Solutions* (*Learning as Developing Competency*, 2021) are skills that have reason to be measured as graduation requirements *and* require SEL skills for their success. Thus, within these *soft-skill* competencies that may be measured, SEL competencies such as *self-management* and *relationships skills* can be part of the indicators; they can be taught and given feedback on. However, a final *grade* or *score* is based on the broader *soft-skill*, which can reduce the issue of labeling and stigmatizing students' identities.

Challenges

Competency-based education is a whole-school reform movement that faces a multitude of challenges (Bingham et al., 2018; Carlyle, 2018; Evans et al., 2019; Gross & DeArmond, 2018; Scheopner Torres et al., 2018; Sturgis & Casey, 2018; S. C. Sullivan, 2016; S. Sullivan & Downey, 2015; Toland, 2017), which motivated the third question of this case study: *What are the challenges experienced by the Core Project?* This section focuses on challenges identified in this study and include: (1) fidelity, (2) state mandates, and (3) communication. Each challenge will be discussed alongside potential solutions.

Fidelity. As discussed earlier in this chapter, fidelity was identified as a challenge at the Core Project because of the difficultly of shifting to a new paradigm, even for teachers that strongly endorsed the competency-based model. As a result, this paper argued for prioritizing professional development around collectively developing mental models more aligned to a competency-based paradigm and for PLCs to establish overarching aims and essential themes. In addition to dissonant beliefs, obstacles to fidelity included the complexity of the continuum and the need for greater coaching around the new model. This section explores these additional two challenges.

Although the data illustrated how the continuum can support instruction and differentiation, the findings indicated challenges for teachers in learning and navigating the continuum's complexity. Teaching to and assessing proficiencies along a 4, 3, 2, 1 scale already requires time, effort, and norming to integrate into a teacher's practice (Gobble et al., 2016; Toland, 2017), and a continuum of varying performance levels adds another level of complexity. Competencies are intended to be more student-facing as opposed to teacher-facing (Schaef, 2016). Yet in practice, both teachers and students reported difficulty interpreting the continuum.

This may be partly due to the detachment the competencies have from both content and disciplines, resulting in the indicators seeming abstract. Writing or revising indicators to be more student-facing is certainly recommended, but some level of abstraction may remain simply by the content-agnostic nature of the competencies. Thus, highlighting a particular indicator in The Core Project teacher competencies, *TC 4.3 Engaging Launch*, educators adopting the continua should place priority on creating exemplars of performance levels (ideally multiple performance levels) before planning instruction for a studio to best provide clarity for themselves, other teachers, and their students on how to accomplish the indicators. If a student or teacher is struggling to interpret the meaning of an indicator, they can look at the exemplar to see what proficiency entails for that specific indicator.

The Core Project's professional development, characterized by collaboration, norming, and use of teacher competencies, provides an encouraging model that is greatly needed in the competency-based education field (Bingham et al., 2018; Gross & DeArmond, 2018; Shakman et al., 2018; Toland, 2017), but professional development was simultaneously identified as a challenge. Similar to other case studies (Gross & DeArmond, 2018; Shakman et al., 2018; S. Sullivan & Downey, 2015), educators discussed needing more time, direction, and coaching. This case study provides an interesting insight into teacher support because the same overall learning model was employed at two different schools with different degrees of fidelity. Although not a controlled experiment and likely affected by multiple variables, from interviews, the difference in implementation between the two schools could at least be partially explained by a difference in administrative support. Thus, although a bottom-up approach that gives teachers autonomy and honors their expertise can create buy-in and amplify innovation (Casey, 2018; Pane et al., 2015; Toland, 2017), concurrently this study's findings demonstrate the importance

of top-down coaching to support teachers in shifting their practice. Similarly, Dufour and Fullan (2013) speak to a healthy balance of bottom-up innovation and top-down support in sustaining change in schools. Reiterating the findings, a teacher summarized the value of guidance in traversing new educational territory: "Transformative change…it requires support, training…It requires a bit of administrative steel…auditing for compliance, and prompt reaction when you see it's not meeting the model."

State Mandates. Another challenge to implementing competency education consistent with other case studies (Carlyle, 2018; Evans et al., 2019; S. Sullivan & Downey, 2015) was the mismatch with state mandates, particularly the dissimilarity between skills and content on state tests as well as the requirement to report traditional grades in a competency-based system. Recognizing these barriers, the Aurora Institute, the leading competency-based non-profit organization in the U.S., recommends that states, in order to foster competency-based education, offer proficiency-based diplomas, build state initiatives to build local capacity, and modernize systems of assessments (Worthen et al., 2019). Multiple existing alternative systems of state assessment currently exist and could include performance tasks, curriculum-embedded performance tests, and portfolios or collections of evidence (Darling-Hammond, 2017).

Core Project schools struggled with aligning to traditional methods of reporting student progress, and educators discussed how translating competencies into letter grades was a major compromise to the functionality and philosophy of competency-based education. Similar studies have revealed competency-based schools reverting back to traditional grading policies after *push back* from parents and creating hybrid grading systems that not only can be confusing and contradicting, but also can interfere with the intent of competency-based education (Scheopner Torres et al., 2018; Shakman et al., 2018). To build local capacity (Worthen et al., 2019), in

addition to proficiency-based diplomas, as the findings indicate, states need to develop differing measurements of yearly progress for competency-based schools. As a Core Project leader explained, even though a state may offer a proficiency-based diploma, many states will still require yearly reporting measurements that do not align with the pre-prescribed timelines in a competency-based system, especially for students that come in behind in proficiencies.

Communication. The challenge of communication with students and parents will be analyzed using the descriptive framework, the *zone of mediation* (Welner, 2001), also used by Scheopner and colleagues in their case study examining competency-based implementation at three New Hampshire competency-based high schools (Scheopner Torres et al., 2018). Schools often enact policies that agree with shared, perceived values and expectations of teachers, administration, parents, and the community that lie within the zone of mediation. Often, policies are disputed when they lie outside this zone. Within the zone-of-mediation framework, forces or factors that can influence school reform include: *inertial*, *technical*, *normative* and *political*. Inertial factors include habits, customs, and routines. Technical forces include organizational structures such as scheduling, curriculum, and resource allocation. Normative forcers include underlying beliefs, and political forces can include the demands of the district, state, community, and parents. (Scheopner Torres et al., 2018; Welner, 2001)

A challenge for the Core Project educators was communicating the competency-based model with students and parents, an obstacle identified in several other case studies (Philhower, 2017; Scheopner Torres et al., 2018; Shakman et al., 2018). From the findings and the literature, parents seem to disagree with competency-based education because of its unfamiliarity, the worry that the absence of traditional grades will impede college applicability (Scheopner Torres et al., 2018; Shakman et al., 2018). Also, parents were concerned that their child may not be

performing as well because grades are based on competence rather than compliance (from the data, this applied especially to parents of *honors* students). These normative and political factors, in this case the expectations of grades by parents, Welner (2001) argues, are often neglected, leading to unsuccessful reform efforts (Scheopner Torres et al., 2018). School administration can address both these factors by leading extensive communication campaigns with the community to discuss what parents want for their kids to gain from school and how competency-based education can better support these goals. Of note, the author also recognizes the enormity and difficulty for school leaders in accomplishing this recommendation.

Addressing political and normative factors through communication with parents is recommended, but the additional political reality that institutions of schooling offer credentials as a cultural currency in the form of credits, grades, diplomas to achieve privileged access also requires recognition (Larabee, 2014). Despite the greater intrinsic and meritocratic value of competency-based education, parents are likely to disagree with systems that eliminate familiar, traditional credentials (credits and grades) that allow their child to progress in the societal hierarchy (college). Recognizing the reality of credentialism, schools and communities should develop systems that can increase the value of competencies over credits and letter grades. For example, one sizable, innovative solution involves creating an alternative high school transcript. Already in existence, the Mastery Transcript Consortium is a network of secondary schools that have replaced the traditional GPA transcript with one that communicates students' unique strengths and abilities, and hundreds of colleges already use them in their admissions (*Welcome to Mastery Transcript Consortium® (MTC)*, 2015). If schools offer methods of communicating student mastery in a manner that employers and colleges prefer, it is likely that competency-based systems and structures will be more widely accepted by a community. The Mastery

Transcript provides an example of creating structures that allow competencies to align with current societal systems, but other creative innovative, and likely smaller-scale innovations are needed.

Lastly, the paradigm of competency-based learning is not limited to the scope of K-12 education, as colleges and employers should also adopt new beliefs and systems that value competence over credentialism (Wagner & Dintersmith, 2015b). For instance, many colleges already recognize the Mastery Transcript and others have abandoned recognizing standardized tests such as the ACT and/or SAT in admissions, which have been challenged as poor predictors of college success and perpetuate privilege (Tough, 2013, 2019). The standardized tests are disconnected and narrow in focus compared to measures of competencies.

Inertial forces can also be leveraged in achieving competency-based education. From the findings, Hill Valley's hybrid grading system, which most closely aligns to an appropriate competency-based reporting system, initially received *push back* from parents, but after many years "it's in the air [the community] breathes now." This example suggests larger parent acceptance to new grade reporting as a result of familiarity – of inertia. For the same reason, the Core Project leaders emphasized the competency-model would work best in a K-12 system (even pre-K-12 system). By only having a competency-based high school, as a new wave of students and parents enter the system, significant effort and resources, even if highly effective would continually need to be repeated each year to address the normative and political forces in transitioning students and parents from K-8 to a new paradigm of education. Further, most early elementary report cards are already competency-based as parents receive feedback on their child's ability to read, write, cooperate, etc. instead of letter grades. Extending this competency-based reporting process to later elementary school, middle school, and then high school would

address inertial forces appearing to be *the way things have always been done*. Although far-reaching, districts within communities are encouraged to collaborate to develop vertically aligned competency-based systems. Westminster Public School District in Colorado is an example of a K-12 competency-based model, and research investigating outcomes and community response is recommended.

Overall, a challenge for competency-based education is communication, particularly with parents. Strategies suggested include addressing normative beliefs with the community and further addressing political forces by establishing more effective structures and systems that support students' capacity to apply to college or gain employment. Lastly, schools within a community should coordinate vertically aligned K-12 competency-based systems to leverage inertial forces.

System-Wide Structures

Tyack and Tobin identify the Carnegie Unit and grades-based structures (which include separated classes by age and by disciplines with one teacher) as two Taylorian elements that make up the grammar of schooling that are particularly resistant to reform efforts (Tyack & Tobin, 1994). Similar factors, flexible assessment and flexible pacing, were shown to be the most difficult elements of competency-based education to implement in a study of Northeast high schools (Evans et al., 2019). Thus, the recommendations in this section are deliberately directed towards transforming these structures, while also acknowledging the historical hurdle.

School-wide systems are necessary for achieving effective rapid and differentiated support. Lack of system-wide coordination resulted in the short life of the secondary school competency-based education movement in the late 1970s (Spady, 1977), but technological advances have the potential of supporting coordination today (Nodine, 2016). Effective learning

management systems (LMSs) are essential in supporting this coordination and should be an immediate goal for those transitioning to competency-based education. In addition, implementing a flexible schedule that supports flexible pacing remains a challenge and innovative models are needed. In this section, I offer a potential *flex-block model* to push this conversation forward and inspire additional inventive models.

Competency-Based Learning Management Systems. The mismatch between traditional LMSs and competency-based education is extensively cited in the literature, indicating a need for competency-based LMS (Basham, Hall, Carter, et al., 2016; Casey & Sturgis, 2018; Evans et al., 2019; Philhower, 2017; Rudenstine et al., 2018; Scheopner Torres et al., 2018). The Core Project LMS, particularly the competency-dashboard, was competency-based and was identified as a factor of success (although the need to report traditional grades remained a challenge). Specifically, the LMS was competency-based because it reported competencies independent of specific courses and allowed all appropriate stakeholders access. These characteristics assisted teachers in meeting students where they were at in lesson planning, and could support students in competencies across classes. For the Core Project, additional and inventive school-wide structures and systems were still needed to effectively provide rapid and differentiated support. However, as the findings also suggest, a competency-based LMS provides a necessary foundation to accomplish school-wide differentiated support.

In addition, the Core Project's LMS was created *from the ground-up* for the needs of the Core Project schools and was open-source code. Considering the flexibility and democratization of open-source code (Jesiek, 2003), it is recommended that schools employ funds and resources to adopt LMSs that can be continually modified for their competency-based needs instead of attempting to fit their new competency-based model to a traditional-grading LMS.

Competency-based LMSs report on competencies detached from classes, which in theory, should make the Carnegie Unit obsolete. That is, by having a competency such as *Constructing an Argument* that sits above any particular class (science, history, or English), earning credit for a class makes less sense if the competency is what is measured (graded). However, as demonstrated in the findings and throughout the literature (Philhower, 2017; Scheopner Torres et al., 2018; Shakman et al., 2018), completely moving away from traditional grades based on the Carnegie unit have not yet been successful. Nonetheless, LMSs are still recommended as an immediate action competency-based schools can take. Although not ideal, conversion systems from competencies to reporting traditional grades may act as temporary *training wheels*. Committing to reporting competencies outside of courses provides a structure that can build inertial force as competency-based LMSs become more familiar to stakeholders. In addition, the structure may influence normative forces that could steer stakeholder mental models to recognize the limitations of the credit-based Carnegie unit, and to appreciate the logic of reporting on competencies.

Schedule. The Core Project schools used the framework of a traditional bell schedule, modified with multiple flexible structures to accommodate the needs of their competency-based system. Despite these adjustments, the schedule was not yet able to sufficiently support the rapid and differentiated support required for competency-based education. A Core Project leader encapsulated what the literature also indicates on scheduling – "no one has it figured out yet." Flex periods, block schedules, and other modifications are commonly implemented at competency-based schools, but scheduling remains a challenge. (Philhower, 2017; S. C. Sullivan, 2016; Toland, 2017) Similarly, high school principals across the Northeast states with competency-based policies report that adequate flexible pacing is currently lacking (Evans et al.,

2019). The bell schedule is a factory structure that is purposefully regimented for efficiency first, and learning secondary (Tyack & Tobin, 1994). Educators will need to adopt new, progressive paradigms to override deeply entrenched traditional systems in order to create new time-based structures that uphold the flexibility required for competency-based education.

Flex-Block Schedule. This paper makes an urgent call to educators to design, implement, and research time-based structures that support competency-based education. To encourage this conversation, I propose a model termed the *flex-block schedule*. The general concept of a larger block of time for support, the central part of the model, has been advocated in the literature and already implemented to a degree in some schools (Casey & Sturgis, 2018; Rudenstine et al., 2018; Wright, 2018). This distinct flex-block schedule has been developed from my contemplation of the findings, discussion with Core Project leaders, and exploration of the literature. I recognize that a flexible schedule is one of the most difficult school structures to uproot. There are as enormous logistical challenges that are entailed in my proposed model. In fact, the Core Project's school's original schedule had similar features to the flex-block schedule, but was difficult to sustain because of its large deviation from what was familiar to stakeholders. Nonetheless, flexible schedules are necessary to achieving and sustain competency-based education. The flex-bock model is a preliminary suggestion, and critical evaluation, discussion, feedback, revisions, and elaborations are welcomed.

Following the design principle, *form follows function*, the compartmentalized school classroom and regimented bell schedule were designed for efficiency. Since the mid to late 19th century this form now maintains the function of schooling today. The flex-block schedule intends to remove the time constraint of the bell period (and, if possible, physical classroom constraints) with a large block of time of about two to three hours called *the flex-block* for

students to engage in their projects, while also providing schools with the flexibility to develop a variety of potential support structures. Many competency-based schools already utilize some type of flex period or have moved to a block schedule to address competency-based learner needs (Evans et al., 2019; Philhower, 2017). The flex-block schedule continues on this trajectory of distancing from the 50-minute bell period by (1) increasing time for differentiated support and (2) expanding block periods beyond individual disciplines and regimented classes. In the flex-block schedule, there is an advisory, discipline-specific classes, and a daily *flex-block*. A potential example is presented on the next page.

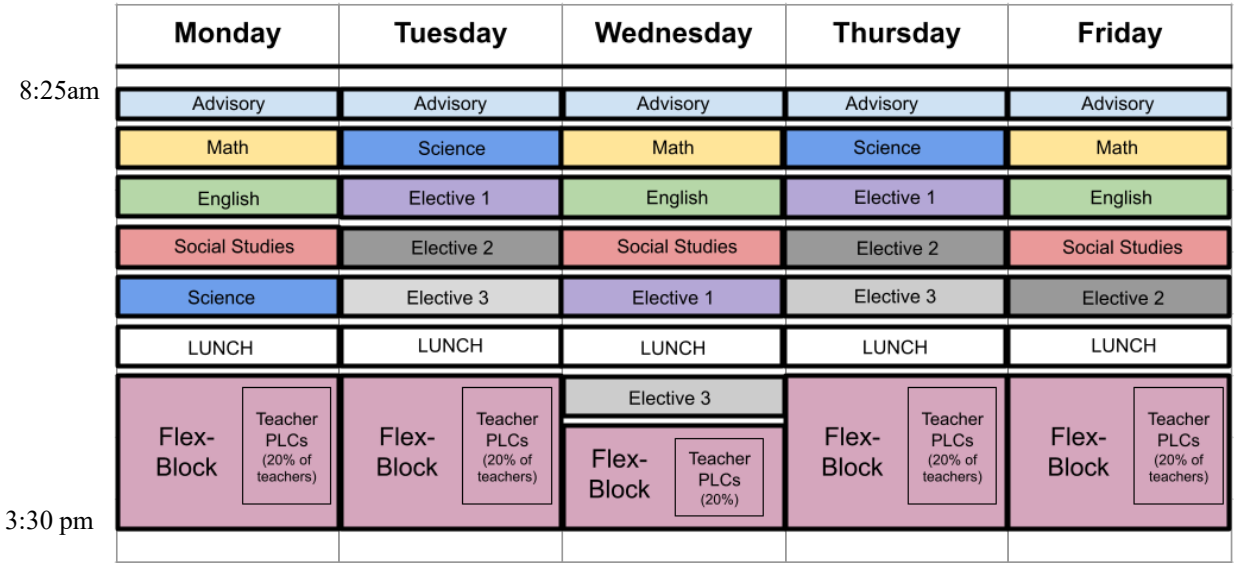

Figure 5.4. Flex-Block Schedule

Recognizing that learners have many different needs and that each community has unique circumstances, a large flex-block gives schools the creative space to implement and test a variety of school-wide differentiated supports. This common school-wide flex-block period provides the capability for educators to coordinate across disciplines to support students. During a flex-block session, a student may have the choice to work independently or cooperatively on their project

with the option to seek feedback from nearby available teachers of varying disciplines. The student can also choose to attend a specific mini-lesson scheduled for that day from another teacher with a small group of peers, or the student can visit a different teacher with only a couple other peers to get more content-specific support. Moreover, as many high schools have *peer tutors*, schools can exercise creative structures and programs, and a student may have the option to visit a peer tutor to ask questions.

Because a flex-block is a large period of time, students that may need extra support would not miss out on engaging in authentic projects. Students that are typically behind are often disengaged, and although catching them up on content is a positive intervention, these students need the opportunity for deep learning that can inspire and change their academic mindsets (Sturgis & Casey, 2018). The large flex-block helps accomplish both. For example, during a flex-block period, a student who needs additional support may spend the first 40 minutes working with a math teacher, use the next hour to work on their authentic project (and are likely to be more passionate about), and afterwards can even receive additional support in English with the remaining time.

Many students will certainly struggle initially with the autonomy a flex period grants, but this is a challenge worth leaning into. Students are not given agency, but instead practice and develop agency as a skill, a competency. Like any competency, students will need the time and practice to fail, receive feedback, and improve. Thus, giving students autonomy (not agency) gives them opportunities necessary for developing competency in agency – along with the self-awareness, and self-control that are parts of it (Stixrud & Johnson, 2019). However, to accomplish an educational model that provides greater autonomy, schools need to support students by coaching them in necessary SEL skills, holding students accountable for their

decisions, and allowing for the gradual release of supervision and control in how they use their flex periods. Rudenstine (2018) provides one example of how an elementary school teacher supports autonomy and agency for her students through a continuum of four different performance levels.

After students demonstrate a certain level of agency, they gain greater autonomy and independence. Therefore, students are only given greater autonomy if it is in their zone of proximal development, and students who cannot yet exhibit higher levels of agency may still be given choice, but they are provided with appropriate support and guidance. Advisory teachers may be good candidates for coaching students in using an agency continuum such as this for how students plan to utilize their flex-block.

Traditional aspects of compartmentalized classes have to be reconsidered in a flex-block schedule. For instance, deep learning would be limited and students would likely become overwhelmed if they undertook a separate project for each of their classes. However, in keeping with The Core Project, multidisciplinary units can be encouraged so students are only working on one, two, or potentially three projects at a time. Thus, the schedule and the transdisciplinary nature of competencies are mutually reinforcing. To provide an example, one studio from the findings centered around the essential question '*What's in a Neighborhood?',* and was explored in social studies, science, physical education, and English classes. If the flex-block schedule in Figure 1 above were implemented, students would attend their standard classes for each discipline throughout the week to provide a common experience, disciplinary content, and practice with the competencies related to the essential question. A student may choose to use the first half of the flex-block time during the week to work on English competencies for the project, while choosing to spending the second half of the week working on the physical education and

science competencies related to their project. This learning can be more coherent and reinforcing if a student is working on different skills that all center around a similar topic and compelling question.

A flex-block can also change the traditional role and responsibilities of the teacher. Because the flex-block time is used for projects and for providing rapid and differentiated support, the teacher role is already geared more towards that of coaching than of delivering. Furthermore, just as students have the time and flexibility to engage in multiple experiences during a flex-block, so do teachers. For instance, one teacher may use the first third of a flex-block to provide a differentiated mini-lesson for a group of struggling students. The second third of the flex-block may be used for prep time, and the last third may be used to coach students working on their projects. Based on the needs of the school, and to provide fairness to teachers, responsibilities and roles within the flex-block may change for teachers throughout the week.

A flex-block can also provide teachers with consistent time to collaborate in PLCs. For example, each day of the week about a fifth of the teachers, from the same discipline or from multiple disciplines (depending on what the school decides), would be released from teaching and would use the flex-block time to work together, norming student work, sharing best practices, and creating resources. Giving teachers sufficient time to advance their practice embedded within the context of their work is essential for professional development (DeMonte, 2013; "The Mirage," 2015), especially for the new territory of competency-based education (S. Sullivan & Downey, 2015). This was recognized at the Core Project, as teachers of the same discipline collaborated during the same prep period, and, on Wednesdays, students were released early – allowing teachers to further collaborate. Instead of releasing students, the flex-block

would allow students to continue learning in school while still having the ability to access about 80% of the teachers for support each day.

The findings of this study illustrate promising classroom structures for differentiation in a competency-based system, but also clearly reveal the need for school-wide support that extends beyond the classroom. An LMS, like The Core Project's, that is transparent to stakeholders and that tracks competencies independent of courses is a prerequisite. The Core Project had components of a flexibility within a typical bell-schedule, but, as other studies indicate (Evans et al., 2019; Reif et al., 2015; S. C. Sullivan, 2016; Toland, 2017), original and innovative models are greatly needed. To encourage this conversation, a flex-block schedule was proposed that allows considerable time and flexibility for coordinating system-wide differentiation, provides students with autonomy to pursue student-centered projects, develop agency, and encourages transdisciplinary projects. Further, a flex-block can favor facilitatory teaching practices and can also be strategically used for consistent and adequate professional development through PLCs.

Recommendations for Further Research

The findings of this study provide a multitude of avenues for potential research that can support the competency-based movement. This study focused on examining the implementation of competencies, their influence on teacher practice, and identification of challenges at The Core Project. Due to the COVID-19 pandemic, the original data collection methods for this study were narrowed. Conducting a similar case study that utilizes observations, as well as the interviews with students, administration, and even parents is recommended. Of particular interest is the perspectives of students around competency-based education. Sullivan (2016) asserts the importance of competency-based research to communicate students' perspectives, states the current dearth of knowledge in the literature, and contributes to this gap with her study. Further,

in her discussion Sullivan indicates the need to include the perspectives of students from lower academic standings. Originally for this study, focus groups of students in the upper third, middle third, and lower third of school academic standings of the Core Project schools were intended to be conducted to gain a more comprehensive view of student experiences. Research that includes data methods such as this would be valuable.

Further research can continue to explore themes and elements highlighted in the findings. For example, further research exploring the implementation of teacher-competencies and their influence on changing teacher practice would be needed to advance competency-based professional development. More in-depth research into advisories about how and to what extent they build relationships and provide holistic academic guidance can also be useful. Lastly, the argument was made for harnessing inertial forces to address communication problems in competency-based reform by implementing competency-based systems for K-12. Therefore, investigating K-12 competency-based education systems with particular attention towards student and parental response can be valuable.

This discussion demonstrated the overlap of competency-based education with many areas of education. It also indicated the lack of research directly addressing many of these connected fields. Therefore, research is recommended that intersects competency-based education with areas such as project-based learning, social and emotional learning, service-learning, and culturally-relevant and sustaining pedagogy. It is further recommended that in additional to publishing in common journals for competency-based research, this research be published in journals that are commonly read by members of these other various fields. For instance, competency-based research connected to social and emotional learning could be published in the journal *Educational Psychologist.*

The study used a qualitative methodology because the competency-based movement is relatively new, and more in-depth, nuanced research, could provide insight for developing models that are still a work in progress. However, quantitative methods are also necessary. Evan's and colleagues' study (Evans et al., 2019), examining the current state of competency-based education in the Northeast states, was useful to have a more widespread pulse on the current state of implementation efforts. Similar studies that examine additional factors or follow up longitudinally can significantly aid educators in implementation and policy efforts. Next, competency-based education mismatches with traditional modes of academic outcomes. Although some common academic outcomes may still be measured, an additional range of outcomes should be measured to provide a more widespread view on the effects of competency-based education. Such outcomes may include alternative state-assessments that require more critical and applicative answers (Darling-Hammond, 2017), self-efficacy, self-concept, and SEL competencies.

References

110 ILCS 148 / Postsecondary and Workforce Readiness Act., (2016). http://www.ilga.gov/legislation/ilcs/ilcs3.asp?ActID=3722&ChapterID=18

2020 Building a grad nation report. (2020). America's Promise. http://americaspromise.org//report/2020-building-grad-nation-report

A different approach to teacher learning: Lesson study. (2015, August 16). APM Reports. https://www.apmreports.org/episode/2015/08/26/a-different-approach-to-teacher-learning-lesson-study

An Act to Ensure the Successful Implementation of Proficiency-based Diplomas, 1666 L.D. (2012).

An Act to Prepare Maine People for the Future Economy, § A1-C5 (2012).

Bailey, C. (2018). *A guide to qualitative field research* (3rd ed.). SAGE.

Bandura, A. (2010). Self-efficacy. In *The Corsini Encyclopedia of Psychology* (pp. 1–3). American Cancer Society. https://doi.org/10.1002/9780470479216.corpsy0836

Basham, J. D., Hall, T. E., Carter, R. A., Jr., & Stahl, W. M. (2016). An operationalized understanding of personalized Learning. *Journal of Special Education Technology*, *31*(3), 126–136.

Bingham, A. J., Pane, J. F., Steiner, E. D., & Hamilton, L. S. (2018). Ahead of the curve: Implementation challenges in personalized learning school models. *Educational Policy*, *32*(3), 454–489. https://doi.org/10.1177/0895904816637688

Bloom, B. (1956). Taxonomy of educational objects, handbook I: The cognitive domain. *New York: David McKay*.

Bloom, B. S. (1968). Learning for mastery. Instruction and Curriculum. Regional Education Laboratory for the Carolinas and Virginia, Topical Papers and Reprints, Number 1. *Evaluation Comment*, *1*(2). https://eric.ed.gov/?id=ED053419

Bloom, B. S. (1984). The 2 sigma problem: The search for methods of group instruction as effective as one-to-one Tutoring. *Educational Researcher*, *13*(6), 4. https://doi.org/10.2307/1175554

Bloomberg, L., & Volpe, M. (2019). *Completing your qualitative dissertation*.

Bowles, S. (1976). *Schooling in capitalist America*. Haymarket Books.

Buehl, D. (2017). *Developing readers in the academic disciplines*. Stenhouse Publishers.

Byrnes, M. (2018). *NAIS - Was Dewey Right? Are Schools a Reflection of Society?* https://www.nais.org/magazine/independent-school/summer-2018/was-dewey-right-are-schools-a-reflection-of-society/

Carlyle, R. (2018). Understanding the experiences of middle school social studies teachers creating personalized learning classrooms: A phenomenological Study. *Doctoral Dissertations and Projects*. https://digitalcommons.liberty.edu/doctoral/1938

Carroll, J. B. (1963). A model of school learning. *Teachers College Record*, *64*(8), 723–733.

Casey, K. (2018). *Moving towards mastery: Growing, developing, and sustaining educators for competency-based education*. iNACOL. https://www.competencyworks.org/wp-content/uploads/2018/11/Moving-Toward-Mastery.pdf

Casey, K., & Sturgis, C. (2018). *Levers and logic models: A framework to guide research and design of high-quality competency-based education systems*. iNACOL. https://www.aurora-institute.org/wp-content/uploads/CompetencyWorks-Levers-and-Logic-Models.pdf

Celio, C. I., Durlak, J., & Dymnicki, A. (2011). A meta-Analysis of the impact of service-learning on students. *Journal of Experiential Education*, *34*(2), 164–181. https://doi.org/10.1177/105382591103400205

Chen, X. (2016). Remedial course taking at U.S. public 2- and 4-year institutions: Scope, experience, and outcomes – statistical analysis report. *National Center for Education Statistics*, 162.

Chetty, R., Hendren, N., Kline, P., & Saez, E. (2014). Where is the Land of Opportunity? The Geography of Intergenerational Mobility in the United States. *The Quarterly Journal of Economics. 129*(4), 1553–1623.

Chu, B., Rosenblatt, N., Cooley, S., Waits, S., Granlund, C., Grubb, B., Daramola, M., Lackie, K., Hamidani, K., Yoshizumi, A., Coates, E., & Roth, S. (2021). *Inequity by Design: How College Placement Policies Perpetuate Institutional Racism*. Seattle WA: Puget Sound College & Career Network, Community Center for Education Results, and Highline College.

CoLab, ReDesign. Retrieved June 16, 2021, from https://www.redesignu.org/colab/

CompetencyWorks releases updated competency education state policy map. (2019). *INACOL*. https://aurora-institute.org/blog/inacol-releases-updates-to-the-snapshot-of-k-12-competency-education-state-policy-across-the-united-states/

Condliffe, B. (2017). Project-based learning: A literature review. Working Paper. In *MDRC*. MDRC. https://eric.ed.gov/?id=ED578933

Corcoran, T., McVay, S., & Riordan, K. (2003). Getting It Right: The MISE Approach to Professional Development. *CPRE Research Reports*. https://doi.org/10.12698/cpre.2003.rr55

Couros, G. (2015). *The Innovator's Mindset*. Dave Burgess Consulting Inc.

Creswell, J., & Poth, C. (2018). *Qualitative inquiry and research design*. SAGE Publications Inc.

Csikszentmihalyi, M. (2014). *Applications of flow in human development and education: The Collected Works of Mihaly Csikszentmihalyi*. Springer.

Csikszentmihalyi, M., & Csikszentmihalyi, I. S. (1992). *Optimal experience: Psychological studies of flow in consciousness*. Cambridge University Press.

Dannenberg, M., & Barry, M. N. (2016, April 5). *Out of pocket: The high cost of inadequate high schools and high school student achievement on college affordability*. Education Reform Now. https://edreformnow.org/accountability/out-of-pocket-the-high-cost-of-inadequate-high-schools-and-high-school-student-achievement-on-college-affordability/

Darling-Hammond, L. (2017). Developing and measuring higher order skills: Models for state performance assessment systems. *Learning Policy Institute*, 64.

DeMonte, J. (2013). High-quality professional development for teachers: Supporting teacher training to improve student learning. In *Center for American Progress*. https://eric.ed.gov/?id=ED561095

Developmental Education FAQs. (2021). *Center for the Analysis of Postsecondary Readiness*. https://postsecondaryreadiness.org/developmental-education-faqs/

Dewey, J. (1897). My Pedagogic Creed. *School Journal*, *54*.

Dewey, J. (1909). *Moral principles in education*. Boston: Hoffton Mifflin Company.

Dewey, J. (1916). *Democracy and Education*. New York: Macmillan.

Dewey. (1902). *The educational situation*. University of Chicago Press. http://archive.org/details/educationalsitu00dewegoog

Dewey, J. (1938). *Experience And Education*. Free Press. https://doi.org/10.1080/00131728609335764

DuFour, R., & Fullan, M. (2013). *Cultures Built to Last: Systemic PLCs at Work TM*. Solution Tree Press.

Durlak, J. A., Weissberg, R. P., Dymnicki, A. B., Taylor, R. D., & Schellinger, K. B. (2011). The impact of enhancing students' social and emotional learning: A meta-analysis of school-based universal interventions. *Child Development*, *82*(1), 405–432. https://doi.org/10.1111/j.1467-8624.2010.01564.x

El-Amin, A., Seider, S., Graves, D., Tamerat, J., Clark, S., Soutter, M., Johannsen, J., & Malhotra, S. (2017). Critical consciousness: A key to student achievement. *Phi Delta Kappan*, *98*(5), 18-23.

Eisner, E. W. (2017). *The enlightened eye: Qualitative inquiry and the enhancement of educational practice*. Teachers College Press.

Elmore, R. F., & Burney, D. (1997). *Investing in teacher learning: Staff development and instructional improvement in Community School District #2, New York City*. National Commission on Teaching & America's Future, Box 117, Teachers College, Columbia University, New York, NY 10027. https://eric.ed.gov/?id=ED416203

Ermeling, B. A. (2010). Tracing the effects of teacher inquiry on classroom practice. *Teaching and Teacher Education*, *26*(3), 377–388. https://doi.org/10.1016/j.tate.2009.02.019

Evans, C. M., Graham, S. E., & Lefebvre, M. L. (2019). Exploring K-12 competency-based education implementation in the Northeast states. *NASSP Bulletin*, *103*(4), 300–329. https://doi.org/10.1177/0192636519877456

Farrington, C., Roderick, M., Allensworth, E., Nagoaka, J., Keyes, T. S., Johnson, D. W., &

Beechum, N. O. (2015). Teaching adolescents to become learners. *UChicago Consortium on School Research*. https://consortium.uchicago.edu/publications/teaching-adolescents-become-learners-role-noncognitive-factors-shaping-school

Fontana, A., & Frey, J. (1994). Interviewing: The art of science. In *Handbook of qualitative research* (pp. 361–376). Thousand Oaks, CA: Sage.

Friesen, R. (2019). *A Quick Overview of The DuFour PLC Model*. Sacajawea PTA. https://www.sacpta.org/news/a-quick-overview-of-the-dufour-plc-model

FSG. (2019). Journeys to personalized learning: Chicago International Charter School, West Belden. *FSG*.

Fundamentals of SEL. (2021). CASEL. https://casel.org/fundamentals-of-sel/

Gallup Student Poll 2015 Results. (2015). Gallup. https://www.gallup.com/services/189863/gallup-student-poll-2015-results.aspx?utm_source=reports&utm_medium=downloademail&utm_campaign=2015GSPresults

Gilbert, J. (2005). *Catching the knowledge wave?: The knowledge society and the future of education*. NZCER Press.

Glaser, R., & Klaus, D. J. (1962). Proficiency measurement: Assessing human performance. *Psychological Principles in System Development*, 419–474.

Gobble, T., Onuscheck, M., Reibel, A., & Twadell, E. (2016). *Proficiency-based assessment: Process not product*. Solution Tree Press.

Goldstein, D. (2014). *The teacher wars: A history of America's most embattled profession*. Anchor Books.

Gross, B., & DeArmond, M. (2018). Personalized learning at a crossroads: Early lessons from

the next generation systems initiative and the regional funds for breakthrough schools initiative. *Center on Reinventing Public Education*, 33.

Gulamhussein, A. (2013). Teaching the teacher: Effective professional development in an era of high stakes accountability. *Washington, DC: Center for Public Education*. https://www.academia.edu/28440314/Teaching_Effective_Professional_Development_in_an_Era_of_High_Stakes_Accountability_READ_THE_REPORT_Center_for_Public_Education

Guskey, T. R. (2002). Professional development and teacher change. *Teachers and Teaching*, *8*(3). https://www.tandfonline.com/doi/abs/10.1080/135406002100000512

Hanauer, N. (2019, June 10). *Better schools won't fix America*. The Atlantic. https://www.theatlantic.com/magazine/archive/2019/07/education-isnt-enough/590611/

Hanushek, E. A., Kain, J. F., & Rivkin, S. G. (1998). *Teachers, schools, and academic achievement* (Working Paper No. 6691; Working Paper Series). National Bureau of Economic Research. https://doi.org/10.3386/w6691

Herold, B. (2017, November 8). The case(s) against personalized learning. *Education Week*. https://www.edweek.org/technology/the-cases-against-personalized-learning/2017/11

Hodge, S. (2007). The Origins of Competency-Based Training. *Australian Journal of Adult Learning*, *47*(2), 179–209.

Iowa Department of Education Guidelines for PK-12 Competency-Based Education. (2016). Iowa Department of Education. https://educateiowa.gov/sites/files/ed/documents/Competency-based%20Guidelines2016-06.pdf

Jacoby, B. (2014). *Service-learning essentials: Questions, answers, and lessons learned*. John Wiley & Sons.

Jagers, R. J., Rivas-Drake, D., & Williams, B. (2019). Transformative social and emotional learning (SEL): Toward SEL in service of educational equity and excellence. *Educational Psychologist*, *54*(3), 162–184. https://doi.org/10.1080/00461520.2019.1623032

Jesiek, B. (2003). Democratizing software: Open source, the hacker ethic, and beyond. *First Monday*. https://doi.org/10.5210/fm.v8i10.1082

Jones, S. M., & Bouffard, S. M. (2012). Social and emotional learning in schools: From programs to strategies and commentaries. *Social Policy Report*, *26*(4), 1–33.

Kendi, I. X. (2019). *How to be an antiracist*. Random House Publishing Group.

Khan, S. (2012). *The one world schoolhouse: Education reimagined*. Hodder & Stoughton.

Larabee, D. F. (2014). Schooling in the United States: Historical analyses. In *Encyclopedia of educational theory and philosophy* (pp. 740–743). Sage Publications, Thousand Oaks, CA.

Learning as Developing Competency. (2021). ReDesign.

Learning as inquiry: Cultivating wonder, connection, and critical conscientiousness through meaningful exploration. (2021). ReDesign.

Lewis, M. W., Eden, R., Garber, C., Rudnick, M., Santibañez, L., & Tsai, T. (2014). Equity in competency-based education: Realizing the potential, overcoming the obstacles. *RAND Education & Jobs for the Future*.

Lincoln, Y., & Guba, E. (2018, October 23). *Naturalistic inquiry*. SAGE Publications Inc. https://us.sagepub.com/en-us/nam/naturalistic-inquiry/book842

Lipman, P. (2011). *The new political economy of urban education*. Taylor & Francis. https://www.goodreads.com/work/best_book/8572600-the-new-political-economy-of-urban-education-neoliberalism-race-and-t

Mahoney, J. L., Weissberg, R. P., Greenberg, M. T., Dusenbury, L., Jagers, R. J., Niemi, K., Schlinger, M., Schlund, J., Shriver, T. P., VanAusdal, K., & Yoder, N. (2020). Systemic social and emotional learning: Promoting educational success for all preschool to high school students. *American Psychologist*. https://doi.org/10.1037/amp0000701

McCombs, J. S., Kirby, S. N., Barney, H., Darilek, H., & Magee, S. (2005). *Achieving state and national literacy goals: A long uphill road*. RAND Corporation.

McKown, C. (2019). Challenges and opportunities in the applied assessment of student social and emotional learning. *Grantee Submission*, *54*(3), 205–221.

Muijs, D., & Harris, A. (2003). Teacher leadership—Improvement through empowerment?: An overview of the literature. *Educational Management & Administration*, *31*(4), 437–448. https://doi.org/10.1177/0263211X030314007

National Research Council (U.S.), Bransford, J., Pellegrino, J. W., & Donovan, S. (Eds.). (1999). *How people learn: Bridging research and practice*. National Academy Press.

National Scientific Council on the Developing Child. (2015). Supportive relationships and active skill-b building strengthen the foundations of resilience: Working Paper 13. http://www.developingchild.harvard.edu

NGSS Lead States. (2013). *Next generation science standards: For states, by states*. Washington DC: The National Academy Press. https://doi.org/10.17226/18290

Nig, H. K., Lee, D., & Lee, W. O. (2015). Relationships between teacher value orientations,

collegiality, and collaboration in school professional learning communities. *Social Psychology of Education: An International Journal*, *18*(2), 337–354.

Noddings, N. (2013). *Education and democracy in the 21st century*. Teachers College Press.

Nodine, T. R. (2016). How did we get here? A brief history of competency-based higher education in the United States. *The Journal of Competency-Based Education*, *1*(1), 5–11. https://doi.org/10.1002/cbe2.1004

O'Connor, K. (2011). *A repair kit for grading: 15 fixes for broken grades*. Pearson.

Hanna, D., David, I., & Fransisco, B. (Eds). (2010). *Educational research and innovation the nature of learning: Using research to inspire practice.* OECD Publishing.

Pane, J. F., Steiner, E. D., Baird, M. D., Hamilton, L. S., & RAND Corporation. (2015). *Continued progress: promising evidence on personalized learning*. RAND Corporation.

Paparo, L. B., & Botel, M. (2016). *The plainer truths of teaching, learning and literacy: A comprehensive guide to reading, writing, speaking and listening pre-K-12 across the curriculum*. Owl Publishing, LLC.

Pashler, H., McDaniel, M., Rohrer, D., & Bjork, R. (2008). Learning styles: Concepts and evidence. *Psychological Science in the Public Interest*, *9*(3), 105–119. https://doi.org/10.1111/j.1539-6053.2009.01038.x

Peoples, L., & Foster, L. (2019). *Researching the effects of culturally responsive mastery-based education*. Students at the Center. https://studentsatthecenterhub.org/resource/culturally-responsive-mastery-based-education/

Philhower, G. (2017). *An examination of high schools that are transitioning to less traditional*

structures to improve student learning [Doctoral dissertation., Indiana State University]. http://search.proquest.com/docview/1914909123/abstract/BDA98A5D0F33497DPQ/2

Pink, D. H. (2009). *Drive: The surprising truth about what motivates us*. Penguin.

Proficiency-Based Grading Parent Information. (2017). Granite School District. https://schools.graniteschools.org/bennionjr/files/2018/01/Proficiency-Based-Grading.pdf

Project Good. (2021). One Stone. https://onestone.org/project-good-1

Ravitch, D. (2020). *Slaying goliath: The passionate resistance to privatization and the fight to save America's public schools*. Knopf Doubleday Publishing Group.

Ravitch, S. M., & Carl, N. M. (2015). *Qualitative research: Bridging the conceptual, theoretical, and methodological*. SAGE Publications.

Reif, G., Ed, M., Shultz, G., & Ellis, S. (2015). A qualitative study of student-centered learning practices in New England High Schools. *Nellie Mae*, 44.

Rickabaugh, J. (2016). *Tapping the power of personalized learning: A roadmap for school leaders*. ASCD

Rising to the Challenge Survey, Part One: Recent High School Graduates. (2014). Achieve. https://www.achieve.org/rising-challenge-survey-1

Roger, R. (2018). *FETC 2018: Ken Robinson argues 2 key points in support of creative schools*. K-12 Dive. https://www.k12dive.com/news/fetc-2018-ken-robinson-argues-2-key-points-in-support-of-creative-schools/515530/

Rudenstine, A., Schaef, S., Bacallao, D., & Hakani, S. (2018). Meeting students where they are. *INACOL*, 41.

Ruus, V.-R., Veisson, M., Leino, M., Ots, L., Pallas, L., Sarv, E.-S., & Veisson, A. (2007). Students' well-being, coping, academic success, and school climate. *Social Behavior and*

Personality, *35*(7), 919. https://doi.org/10.2224/sbp.2007.35.7.919

Ryan, R. M., & Deci, E. (2012). *The Oxford handbook of human motivation*. Oxford University Press, USA.

Ryan, S., & Cox, J. D. (2017). Investigating student exposure to competency-based education. *Education Policy Analysis Archives*, *25*(0), 24. https://doi.org/10.14507/epaa.25.2792

Savage, G. (2017). *Neoliberalism, education, and curriculum.* Powers of curriculum, sociological perspectives on education. 143-165.

Schaef, S. (2016, October 9). *What IS the difference between competencies and standards?* ReDesign.Org. https://www.redesignu.org/what-difference-between-competencies-and-standards

Scheopner Torres, A., Brett, J., Cox, J., & Greller, S. (2018). Competency education implementation: Examining the influence of contextual forces in three New Hampshire secondary schools. *AERA Open*, *4*(2), 2332858418782883. https://doi.org/10.1177/2332858418782883

Schonert-Reichl, K. A. (2019). Advancements in the landscape of social and emotional learning and emerging topics on the horizon. *Educational Psychologist*, *54*(3), 222–232. https://doi.org/10.1080/00461520.2019.1633925

Senge, P. M. (2010). *The fifth discipline: The art & practice of the learning organization*. Crown Publishing Group.

Shakman, K., Foster, B., Khanani, N., Marcus, J., & Cox, J. (2018). “In theory it’s a good idea”: Understanding implementation of proficiency-based education in Maine. *Educational Development Center, Inc.*

Shwartz, Y., Weizman, A., Fortus, D., Krajcik, J., & Reiser, B. (2008). The IQWST experience:

Using coherence as a design principle for a middle school science curriculum. *Elementary School Journal*, *109*(2), 199–219. https://doi.org/10.1086/590526

South Carolina Profile of a Graduate Prototype Competencies. (2019). South Carolina Department of Education. https://ed.sc.gov/index.cfm?LinkServID=A266E8D9-037B-A6EC-16F92FEC55DFA610

Spady, W. G. (1977). Competency-based education: A bandwagon in search of a definition. *Educational Researcher*, *6*(1), 9–14.

Stixrud, W., & Johnson, N. (2019). *The self-driven child: The science and sense of giving your kids more control over their lives*. Penguin.

Sturgis, C., & Casey, K. (2018). Quality principles for competency-based education. *INACOL*, 128.

Sturgis, C., Patrick, S., & Pittenger, L. (2011). Highlights from the 2011 competency-based learning summit. *Online Learning*, 42.

Sullivan, S. C. (2016). *Intrinsically intertwined: Student perspectives of successes and challenges in a competency-based public high school* [Doctoral dissertation., Montana State University]. http://search.proquest.com/docview/1829569214/abstract/8958CDE38D7F48EEPQ/1

Sullivan, S., & Downey. (2015). Shifting educational paradigms: From traditional to competency-based Education. *American Secondary Education*, *43*(3), 4–19.

Taylor, R. D., Oberle, E., Durlak, J. A., & Weissberg, R. P. (2017). Promoting positive youth development through school-based social and emotional learning interventions: A meta-analysis of follow-up effects. *Child Development*, *88*(4), 1156–1171. https://doi.org/10.1111/cdev.12864

The Mirage. (2015). *TNTP*. https://tntp.org/publications/view/the-mirage-confronting-the-truth-about-our-quest-for-teacher-development

Thomas, G. (2015). *How to do your case study* (2nd ed.). SAGE.

Thomas, J. W. (2000). A review of research on project-based learning. *The Autodesk Foundation*, 49.

Toland, C. (2017). *Implementing proficiency-based learning: Perspectives of three Vermont high school social studies teachers* [Doctoral Dissertation, The University of Vermont and State Agricultural College]. http://search.proquest.com/docview/1845309129/abstract/158B4735185B4F47PQ/1

Toshalis, E., & Nakkula, M. J. (2012). Motivation, engagement, and student-voice. *Students At The Center*. https:// studentsatthecenterhub.org/wp-content/uploads/2012/04/Motivation-Engagement-Student-Voice-Students-at-the-Center-1.pdf

Tough, P. (2013). *How children succeed: Grit, curiosity, and the hidden power of character*. RH Books.

Tough, P. (2019). *The years that matter most: How college makes or breaks us*. Houghton Mifflin Harcourt.

Tyack, D., & Cuban, L. (1995). *Tinkering toward utopia*. Harvard University Press. https://doi.org/10.2307/j.ctvjz83cb

Tyack, D., & Tobin, W. (1994). *The "grammar" of schooling: Why has it been so hard to change? American Educational Research Journal.* 31(3), 453-479

Tyler, R., W. (1949). Achievement testing and curriculum construction. *Trends in Student Personnel Work*, *3914107*.

Vescio, V., Ross, D., & Adams, A. (2008). A review of research on the impact of professional

learning communities on teaching practice and student learning. *Teaching and Teacher Education: An International Journal of Research and Studies*, *24*(1), 80–91.

Villarroel, V., Bloxham, S., Bruna, D., Bruna, C., & Herrera-Seda, C. (2018). Authentic assessment: Creating a blueprint for course design. *Assessment & Evaluation in Higher Education*, *43*(5), 840–854. https://doi.org/10.1080/02602938.2017.1412396

Voelkel, R. H., Jr., & Chrispeels, J. H. (2017). Understanding the link between professional learning communities and teacher collective efficacy. *School Effectiveness and School Improvement*, *28*(4), 505–526.

Vygotsky, L. S., & Cole, M. (1978). *Mind in society: Development of higher psychological processes*. Harvard University Press.

Wagner, T., & Dintersmith, T. (2015). *Most likely to succeed: Preparing our kids for the innovation era*. Simon and Schuster.

Welcome to Mastery Transcript Consortium® (MTC). (2015, December 10). https://mastery.org/

Welner, K. G. (2001). *Legal rights, local wrongs: When community control collides with educational equity. SUNY Series, Restructuring and School Change*. State University of New York Press.

Wiggins, G. P., & McTighe, J. (2001). *Understanding by design*. Merrill/Prentice Hall.

Wineburg, S., & McGrew, S. (2017). *Lateral reading: Reading less and learning more when evaluating digital information* (SSRN Scholarly Paper ID 3048994). Social Science Research Network. https://doi.org/10.2139/ssrn.3048994

Wolcott, H. F. (2010). *Ethnography lessons: A primer*. Left Coast Press.

Wood, S. M. (2010). *Student access to Advanced Placement® (AP®) coursework: Principals'*

beliefs and practices [Ph.D., Loyola University Chicago]. http://search.proquest.com/docview/502188895/abstract/DF3E77F6812B40B8PQ/11

Worthen, M., Truong, N., & Casey, K. (2019). *Modernizing the teaching workforce for learner-centered, competency-based, equity-oriented education: State policy recommendations*. Aurora Institute.

Wright, N. (2018). *Becoming an innovative learning environment: The making of a New Zealand secondary school*. Springer.

Yin, R. (2017). *Case study research and applications: Design and methods.* Google Books.

Yoder, N. (2014). Teaching the whole child: Instructional practices that support social-Emotional learning in three teacher evaluation frameworks. Research-to-Practice Brief. *Center on Great Teachers and Leaders.*

APPENDICES

Appendix A: Letter of Support

**This letter of support was drafted by myself for the administrators of Hill Valley and Hawkins*

I am writing this letter of support for Thomas Wolfe. It is our intention to support the research described below.

Research Overview:

1. **Project Summary**
   Thomas Wolfe will be conducting a case study with Hill Valley / Hawkins teachers and curriculum to answer the research question: *How do competencies influence teacher practice and influence student learning experience?*

2. **Objectives**
   Interviews:
   - To learn about their experiences in teaching with competencies, Thomas Wolfe will conduct interviews with Hill Valley / Hawkins teachers from the core subjects and advisories. Interviews will not begin until the school year is complete. Teachers will be asked questions about how they use competencies in curriculum, design, instruction, and assessment.
   - Thomas Wolfe may conduct interviews with myself (the school leader if available) and will conduct interviews with Core Project Leader #1 about our experiences leading teachers and managing a competency-based system.

   Artifacts:
   - Thomas Wolfe may ask participants for documents such as examples of curriculum materials and examples of *deidentified* student work.

3. **Background & Rationale**
   Competency-based is small, yet rapidly growing movement in K-12 education. However, no literature has been found on schools that explicitly employ skill-based competencies and there are a very small number of schools in the U.S. that use them. This case study seeks to better contribute an understanding around competencies to the educational literature.

Sincerely,

Administrator

Appendix B: Email to Teachers

Hello Core Project teachers,

Nice to meet you via email. To give you a better idea of who I am, my research, and how you might participate, I created this **short video**.

After watching the video, if you would be willing to participate in the research, please read over and complete the information sheet provided in the Google Form link below to give your voluntary agreement to participate in the research. In addition, the Google Form will ask a few questions that will best allow you and I to schedule interviews that best work around your schedule. Soon after the Google form is completed, I will contact you via email.

Link: Google Form for Information Sheet and scheduling interviews

Appendix C: Video to Teacher Script

Hello, my name is Tommy Wolfe and I am a high school science teacher, specifically for biology and physics, at Stevenson High School in Illinois. I am also currently in graduate school pursuing my doctorate in education at DePaul University in Chicago.

From my explorations, very few competency-based schools actually use competencies rather than standards. Competencies that are skill-based, follow a leveled continuum, and require the authentic application of knowledge like you do at your school. For my dissertation, I hoping to conduct a qualitative case study on how these competencies influence your practice as a teacher and student learning experience.

I would greatly appreciate if you would be willing participate in Zoom interviews about your experience teaching with competencies. In addition, I may ask for examples of competencies, curriculum materials, or examples of student work.

I am eager to learn about your work around competencies not only as a researcher, but also as a teacher wanting to better my own practice. I hope you are able to gain something from this process as well.

Appendix D: Participant Google Form

Participation in Case Study on Competencies Form

Thank you for your interest in participating in this study. The goal of this research is to explore how using competencies influences teacher practice and student learning experience.

Below is the Information Sheet that provides the details of the study and what your participation entails. Please read the Information Sheet and sign the Google Form below to confirm your voluntary agreement to be part of the research.

After signing the information sheet, the Google Form continues with questions for scheduling an observation or interview that works around your schedule.

INFORMATION SHEET FOR PARTICIPANTS EMBEDDED IN FORM (SEE APPENDIX E FOR FORM)

By signing your FULL NAME below, you are indicating your voluntary agreement to be part of the research study. You can choose not to participate in any part of the research at any time. If you have questions about the research before signing do not hesitate to contact me at (email address) or (phone number). *

Your answer

Information to help schedule interview(s)

Courses you teach *

Your answer

Preferred email of contact? *

Your answer

Do you teach an advisory? *

Yes

No

Are there any other preferences or information that would be helpful for me to know or accommodate your participation in this study?

Your answer

Appendix E: Participant Information Sheet

INFORMATION SHEET FOR PARTICIPATION IN RESEARCH STUDY

TEACHER INTERVIEW AND DOCUMENT COLLECTION

How do competencies influence teacher practice and student learning experience?

Principal Investigator: Thomas Wolfe *(doctoral candidate)*, DePaul University

Institution: DePaul University, USA

Faculty Advisor: Donna Kiel, Ed.D., College of Education

I am conducting a research study because I am trying to learn more about how competencies influence teacher practice and student learning experience. I am asking you to be in the research because you are an educator involved with The Core Project and have direct experience teaching or working with competencies.

If you agree to be in the research, you will be asked to complete one to three audio-recorded interviews. In addition to the interview, I would request documents such as, curriculum materials or examples of student work that would be de-identified before I receive it. You do not have to share these documents, even after you've participated in an interview.

The interviews will include questions about your experience with competencies, particularly successes, challenges, shifts in practice, and how you use competencies in curriculum design, instruction, and assessment. I will also collect information about your educational experience that include – previous experience, years of teaching, and courses taught. If there is any question you do not want to answer in the interview, you can choose not to. An interview should take approximately 30-40 minutes. I intend to conduct two to three interviews with you. However, you may choose to only conduct one interview and can choose not to not take part in any subsequent interviews at any time. When interviews are initially conducted they will be audio-recorded so the data will initially be linked to you. However, the recordings will soon be transcribed leaving out any identifiable information and the initial audio-recordings will be deleted.

Although the interview transcripts will be de-identified and any documents collected will be de-identified, for organizational and data analysis purposes, this information will be linked to you with a code number and I will have a key that tells me who that code number belongs to. So, for a period of time, it is possible to link this information to you. However, I have put some protections in place, such as storing the information in two separate, secure, password-protected accounts. After the study is completed, I will delete the key so data cannot be linked back to you.

Your participation in this study is voluntary, which means you can choose not to participate. Your decision whether or not to participate will not affect your relationship with The Core Project or you job standing. There will be no negative consequences if you decide not to participate or change your mind later after you begin the study. You can withdraw your participation at any time, by contacting me (Thomas Wolfe) at: (phone number). Since the information you gave me is still identifiable through a code, I can remove your data from the research at any time.

Upon completing the first interview, you will receive a $15 electronic gift card as a token of appreciation for participating in the study that includes the following options: – Chipotle, Target, Amazon.

If you have questions, concerns, or complaints about this study or you want to get additional information or provide input about this research, please contact me at (phone number) or (email address).
If you have questions about your rights as a research subject, you may contact DePaul University's Director of Research Compliance, in the Office of Research Services at 312-362-7593 or by email at sloesspe@depaul.edu. You may also contact DePaul's Office of Research Services if:

- Your questions, concerns, or complaints are not being answered by the research team.
- You cannot reach the research team.
- You want to talk to someone besides the research team.

Sincerely,

Thomas Wolfe

Appendix F: Teacher Interview Protocol

This conversation is being recorded for research purposes. Please let me know now if you do not agree to being recorded. You may request that the recording stop at any time.

Background information:

- Years as a teacher?
- Years at school?
- Course you teach?

Open-ended central question:
Briefly explain knowledge of competencies so conversation centers more on *how* competencies influence learning rather than *what* competencies are.

- As a teacher, what has been your experience with competencies? (What you choose to talk about is important).

General Probing Questions:

- Could you tell me more about this?
- What are you thinking about in particular?
- Could you give me an example?

Specific, possible probing questions to choose from:

- What does a typical day of class look like?
- How do you use competencies…
    - to design curriculum?
    - in instruction?
    - in assessment?
- What has been successful in teaching with competencies?
- What has been most challenging in teaching with competencies?
    - Can you explain how you teach with the different types of competencies in mind:
        - Core Content Areas
        - Habits of Success
        - Wayfinding Experiences
        - NextGen Essentials
- Has your mindset or philosophy of education/teaching since teaching this way? If so, how?
- How have you learned to use competencies (in curriculum design, instruction, or assessment) in a competency-based system? What has your professional development looked like?
- Can you describe advisory? How do you engage students with competencies during advisory?
- As a teacher working with competencies, what is most important for other teachers to know about engaging in this work?
- What do you think is most needed in the field to support this type of work for teachers?