PERSONALIZED LEARNING: A CASE STUDY OF SUPPORTING LITERATURE APPLIED TO PRACTICE AND IMPLEMENTATION IN A HIGH SCHOOL

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This mixed methods case study examined a high school claiming to use personalized learning strategies. A review of literature revealed guiding supports that are used as a lens for data collection and analysis. The purpose of the study was to explore personalized learning through evidence, indicating the presence or absence of the guiding supports derived from the literature, focused specifically on the beliefs and practices of both teachers and principals. The seven guiding supports included (1) Professional Development for Teachers; (2) Readily Available Technology for all Students; (3) Flexible Scheduling; (4) Diagnosis of Relevant Learner Characteristics; (5) Emphasis on Learning to Mastery; (6) Interdisciplinary Approaches; and (7) Collegial School Culture Influencing Systemic Change. The study used two questions: 1) How is personalized learning described in a school professing to implement personalized learning?

(2) How does the concept of personalized learning in a school map onto seven guiding supports of personalized learning strategies drawn from the literature? To illuminate and understand the qualities of the case, the study was conducted in several phases of inquiry. Participants from the high school participated in an online survey. Subsequently, the survey data was used as a filter to identify interview questions with both a teacher and a principal to understand better how their experiences related to various supports for implementation as

defined in the literature review. Analysis of several documents provided a third exploration of the literature lenses. The study revealed that while personalized learning is a high-interest topic in professional practice, the term has not been adequately defined. The study further revealed that educators might benefit from unified explanations of how personalized learning impacts expectations of performance at the local, state and federal levels. Finally, the study revealed that school leaders could be empowered by developing a heuristically-led way of thinking.

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PREFACE

In the course of writing a dissertation, there are many human supports that make the experience possible. It would be impossible to list every single person, so I offer my thanks to some very special individuals:

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1.0   INTRODUCTION

1.1   BACKGROUND

Contemporary shifts in educational practice indicate progressive adaptations in how educators prepare students for an evolving new economy. Parents often assert the notion that students are bombarded with requirements to function in a twenty-first century world. For example, outside of the classroom, students are constantly learning new content by engaging with social media, communicating internationally in real-time and acquiring content through technological channels faster than their teachers could possibly deliver within the confines of a traditional classroom period.

In stark contrast, within many K-12 learning venues, the process of education has remained largely unchanged, designed around fixed time structures, institutional traditions, and value and belief principles ingrained into teachers who face a challenge to adapt their practice appropriately. Teachers who were taught from kindergarten through high school in traditional "one size fits all" classrooms may experience great challenge in adapting their learning environments to address the evolving needs of today's learners. As post-secondary learners, many teachers acquired their professional skills and knowledge as a result of instructional methods courses designed for a traditional instructional landscape.

Some would argue that this static approach perpetuates a delay in the process of change and adaptability necessary to inspire innovation in today's classrooms. Recent value-added measurement of student achievement has uncovered specific deficiencies in the current design of schooling as students are overwhelmed with content mismatched to their ability levels, rather than being taught to a level of functional competence. To illustrate the case in which content and experiences are not personalized on an individual level, Wright, Horn, and Sanders (1997) describe a concern about academic gains decreasing as the average achievement levels of students rise. They infer that "possible explanations include lack of opportunity for high-scoring students to proceed at their own pace, lack of challenging materials, lack of accelerated course offerings, and concentration of instruction on the average or below-average student" (p. 66).

There is an emerging revolution within the profession, where the redesign of "how we do school" within schools may change with the opportunity of further exploration and enhanced professional practice. Recently, the concept of Mass Customized Learning (McGarvey & Schwan, 2012) appeared as an intriguing notion for consideration.

McGarvey and Schwan define Mass Customized Learning as a flexibly scheduled, meaningful, individualized learner-specific experience with a goal of a mastery level of skill attainment (McGarvey & Schwan, 2012). Their proposal requires practitioners to suspend traditional definitions of outcomes and to identify the processes that underlie and constitute deep and authentic learning. Most often, their preferred learning environment strategically involves the use of mobile or personalized devices, commonly in a one-to-one application. Such devices permit educators to implement different pedagogical approaches and time flexibility for students to learn at a mastery level - the core of the authors' beliefs about **personalized learning**.

In contrast to Mass Customized Learning, the term <u>personalized learning</u> is used for this study to facilitate analysis and investigation of the body of literature assembled. It is intended to encapsulate an approach to a learning relationship with a student, rather than a cliché or fad-like name, such as Mass Customized Learning. The former part of the name, "personalized," is similar but not identical to mass customization of virtually anything. Paralleled examples of a "customized" lifestyle in McGarvey and Schwan's work (2012) are "customized" Amazon shopping lists, tailor-made Starbucks coffee beverages, and preferred music choices within iTunes playlists. The authors infer that learning environments could receive similar treatment. In a hypothetical example, students would create topical "wish lists" to make a choice of content to study, enact a pace of course progression of their own will, and seek outcomes that demonstrate knowledge of content.

1.2   PURPOSE OF THE STUDY

The goal of this study was to investigate the implementation of personalized learning in a high school setting and map the observed practices to a framework of concepts from the literature related to and in support of personalized learning as a means to research promising practices for establishing personalized learning environments within schools. I identified present-day factors influencing successful integration of personalized learning into innovative school operational and scheduling formats and sought to understand the most promising areas where personalized learning may occur.

Personalized Learning presents an attractive vision whereby learning systems may abandon the industrial, time-based approach to instruction and replace it with a contemporary

learning-based system that fulfills every learner's need at his/her present performance level. Rickabaugh (2016) describes the industrial model of learning as an experience "to provide substantially the same learning stimuli to everyone in the class at the same time" (p. 22). Educators might describe personalized learning opportunities as methods to explore students' most effective modality of learning, affording a learner a scenario in which to attain mastery-level comprehension of skills. The description may include highlighting essential concepts in a content area hoping to engage the student in content and activities that are relevant and exciting.

There are varied themes in the practice and the research that assume a similar linkage between <u>mass customized learning</u> and <u>personalized learning</u>. In many contemporary conversations among practitioners, the terms are used interchangeably, often to the point of confusion. The heart of the personalized approach is that instruction is intended to be different for every student's learning style and environmental needs to enable him or her to achieve content and skill mastery. Rickabaugh (2016) refers to this as "learning that starts with the learner" inferring that "any connections that students make will be based on their experiences, interests, goals and needs" (p. 24). The root of the word "personalized" is "personal." It is necessary to distinguish between the concepts of personal and personalized, as they are <u>not</u> identical.

There is diversity in the reasons why a high school would pursue personalized learning at all. Toshalis and Nakkula (2012) indicate one possible reason, related to how high school students seek greater independence, stating learning environments "that capitalize on the power of self-determination can substantially increase achievement and motivation" (p. 32). One impetus is the proliferation of mobile devices, which are now in the hands of teenagers, perhaps resulting in different expectations of communication and focus. Theoretically, every school in

the country could be mapped on a continuum of purely traditional methods of instruction (e.g., no personalization) to an opposite scenario that provides multiple strategies to reach learners. The latter on the continuum are often schools that advertise and endeavor to offer personalized learning.

My background in teaching various levels of Chemistry and Science in grades 9-12 and my experience as an administrator in grades 7-12 have shaped my interest in personalized learning; I have witnessed so many students contending with the academic content of today's school instruction in a half-hearted manner. Student ownership of the learning environment may lead directly to meaningful student involvement (Fletcher, 2008). Many students lack a desire to participate in educational content with depth, often because of the pacing of a course and inadequate time allotted. Personalizing the learning experience for a student has the potential to center educational practice on the goals of differentiating instruction, adapting pacing and providing adequate instructional presentations for a diversity of learning styles. A greater attainment of mastery is possible through highly meaningful and individualized learning. The hope is to reveal the interconnections among the practices of personalized learning, as mapped onto the literature sources supporting such practice.

To clearly reiterate, the purpose of this study was to investigate the implementation of personalized learning within a high school setting, mapping observed practices onto a framework of literature related to and supporting personalized learning as a means to explore promising practices for establishing personalized learning environments within schools.

1.3   RESEARCH QUESTIONS

To enhance comprehension of personalized learning, I gathered data from teachers and administrators working in a Pennsylvania high school in an effort to review stated and observable practices as they relate to the literature underpinnings. The goal was to follow a case study design with one high school; this effort was to better understand the school's practices regarding the personalized learning they advertise to their constituents, subsequently mapping the findings onto a body of literature derived from similar instructional practices. There are two specific research questions:

1. How is personalized learning described in a school professing to implement 'personalized learning?'

2. How does the concept of personalized learning in a school map onto seven guiding supports of personalized learning strategies drawn from the literature?

1.4   SIGNIFICANCE OF THE STUDY

Personal learning involves an "intellectual intimacy" (Dewey, 1907) between the learner and the content to be learned, perhaps as a method to uncover his or her personal interests in the world. Personalized learning shifts the focus onto how the student receives an instructional experience, and how the learning approach is tailored for individual competency and mastery, at a pace of individual choice. John Dewey (1907) supported a notion of personalized learning over a century ago. He referenced a revolutionary shift in "the center of gravity" as indicated in an excerpt from *The School and the Life of the Child*: "I may have exaggerated somewhat in order to

make plain the typical points of the old education: its passivity of attitude, its mechanical massing of children, its uniformity of curriculum and method" (p. 51).

Dewey (1907) further elaborates that the center of gravity is unfortunately outside the child. In this notion, Dewey (1907) states "the center of gravity is in the teacher, the text-book, anywhere and everywhere you please except in the immediate instincts and activities of the child himself" (p. 51). Also, in his 1907 work, Dewey predicted a change which is coming into education premised on this *shifting of the center of gravity*. Then Dewey (1970) describes this as

> a change, a revolution, not unlike that introduced by Copernicus when the astronomical center shifted from the earth to the sun. In this case, the child becomes the sun about which the appliances of education revolve; he is the center about which they are organized. (p. 51)

Some could argue that personal learning has promise, enabling a pathway to the ability and interest levels of the student; the child attains mastery via the instructor's facilitation of strategies, devices, or tasks. The point is for children to answer their questions about the world, gaining full comprehension of concepts with efficacy. With the advent of modern technology in the form of personal, mobile devices, often referred to as 1:1 device programs, the action of bringing personalized learning to schools, en masse, has the potential to become a vision fulfilled. Zheng, Arada, Niiya, and Warschauer (2014) elaborated on the use of mobile devices in schools by creatively listening to student voices, collecting perspective and opinions of how students perceive their learning with the addition of mobile devices in classrooms. Albeit specific to laptops, the study (Zheng et al., 2014) found that more than half of student comments indicated that "laptops improved learning efficiency" and "creating activities that are made more

efficient with laptops may be important in garnering and sustaining student support for the program" (p. 295).

Personalizing a learning environment is not new in K-12 education. The goal is not to seek out how this is a nouveau approach to teaching and learning. It has become, however, a more intriguing model of educating students as students have greater access to mobile devices. An analogy to be applied is one of a garden and the tools associated with a garden. While planting seeds and growing fruit has often been routine and purposeful, the soil of the garden itself has become more fertile with improved tooling. Mobile devices (e.g., smartphones, iPads, and laptops) with the addition of learning management systems (e.g., Schoology, Moodle, Blackboard) have the potential to make the personalization more accessible for administrators and teachers to design and to implement.

1.5   MODELING PERSONALIZED LEARNING

Peter Senge (1990) is responsible for seminal work on the concept of learning organizations where interactive and interdependent learning predominates. The primary rationale for the creation and existence of such organizations is that, given scenarios of accelerated change, only those organizations that are flexible, adaptive, and productive may realize operational success. While all people have the capacity to learn, the structures within which they are often required to operate may restrict the type of reflection and commitment that is paramount to learning. According to Senge, organizations expand their capacities to create their own futures through interdependence, where each person recognizes his or her commitment to the learning of others. Further, Senge (1990) found that, for many learners, truly exceptional learning experiences are

deeply personal, meaningful, and memorable when the environment is engaging, enlightening and optimally relevant. The classic bell curve may be the catalyst for a highly individualized survival type of thinking about learning where one learner's success is defined relative to all other individuals who will earn a discreet place on that curve.

Senge (1990) recognizes that survival learning, or what is more often termed "adaptive learning," is paramount and necessary. Additionally, a learning organization must go beyond "adaptive learning" and infuse "generative learning," which is learning that enhances our capacity to "create" (Senge, 1990, p. 14). The dimension that distinguishes learning organizations from more traditional organizations is the shared responsibility for mastery of content and the efficacy of a truly creative learning operation (Senge, 1990).

Senge (1990) identifies five disciplines that converge to provide the foundation for innovative learning organizations. Senge (1990) further specifies that the disciplines are itemized as systems thinking; personal mastery; mental models; building shared vision; and team learning. He elaborates on the need for these disciplines to have a working functionality within an organization for it to qualify as a *learning* organization, premised on the sincerity of systems thinking. Senge (1990) writes that systems thinking is needed more than ever because we are becoming overwhelmed by complexity, given the exponential proliferation of knowledge at a pace of acceleration beyond what anyone can hope to absorb independently.

Simultaneously, expectations for efficient, effective learning are increasing as humankind's need to manage complexity is increasing. Expectations create complexities, whereas effective learning organizations have advantages for capacity resulting in significant adaptation and change; they transition from simply reacting to the current conditions and exhibit

a true capacity to influence and shape the future. The author advocates that the best pathway to truly meaningful and personalized learning is through social and interactive exchanges.

1.6   IMPORTANCE TO STUDY

An increasing number of schools are advertising personalized learning as a way to attract students to their institutions, in an effort to compete with non-traditional schools such as charter schools and cyber-charter schools. Some may argue that awareness and cognition of learning theory among educators becomes paramount to adequately addressing the characteristics of learners enrolled in K-12 education environments. With a new generation of students currently enrolled in K-12 education dubbed "Generation Z," educators may be surprised to observe that personalized learning feels natural due to their often 'made-to-order' life environment. Seemiller and Grace (2017) elaborated on this generation by stating "not only are they accustomed to engaging in individual learning, our study found that these students prefer it because they can focus, set their own pace, and make meaning of their learning before having to share that meaning with others" (p. 23). The essential learning needs of our current K-12 students provide us fertile ground for exploring the topic of personalized learning in high schools.

2.0   REVIEW OF THE LITERATURE

2.1   PERSPECTIVES ON PERSONALIZED LEARNING

2.1.1   Similarities of personalized learning to differentiated instruction

The purpose of this chapter is to engage the reader in a multitude of literature lenses that support how a personalized learning approach manifests itself in contemporary practice. A body of literature contextualizes ideas that underpin strategies in personalizing learning. These differentiated approaches to instruction seek to address students of varied content-readiness levels and modes of learning when present in the same classroom (Stradling & Saunders, 1993; Tomlinson, 2003). As Stradling and Saunders (1993) state, differentiated instruction is "the process of matching learning targets, tasks, activities, resources, and learning support to individual learners' needs, styles, and rates of learning" (p. 129). In contrast to personalized learning, differentiated instruction focuses on delivery, rather than on a self-directed approach to learning. Dewey's (1907) "shifting center of gravity" now may be contemplated as a shift in the locus of control from learning facilitator (i.e., teacher) to the learner. Tomlinson (1999) infers that settings utilizing differentiated instruction are designed to deliver varied learning scenarios for students that have a differing competency, modality/style of learning, and varied interests. Tomlinson (1999) further suggests that, when differentiating instruction, teachers can challenge

all learners by providing varied levels of difficulty, adapting the amount of scaffolding, and modifying the way in which students demonstrate effort. Teachers using differentiated instruction often have a goal to capitalize on the individual student's growth and abilities by delivering learning at the precise level of the student's understanding, further maximizing their learning experience.

This is *slightly* different from personalized learning, where teachers facilitate learning activities and experiences, and in contrast, provide choice to their students in which path they choose. According to Tomlinson (1999), differentiated classrooms have a core belief that students of similar age differ in their readiness for learning and have unique life experiences and circumstances. Tomlinson (1999) further asserts that differences in abilities and experience are not negligible, but rather should be adapted for pacing and the level of intervention that they need from their teacher. Tomlinson (1999) concludes, "for all its promise…effective differentiation is complex to use and thus difficult to promote in schools. Moving toward differentiation is a long-term change process" (p. 6).

Differentiated instruction is rooted in assessment, like personalized learning; in contrast, however, it is often teacher-chosen and teacher-driven. Another similarity between the two modalities is that differentiated instruction, like personalized learning, explicitly emphasizes multiple approaches to teaching content (Tomlinson, 1999).

2.1.2 Similarities of personalized learning to self-paced instruction

One attribute of personalized learning is the self-directed, self-pacing of the learning experience. Self-paced instruction is an arrangement in which individual students set a personal schedule for learning and monitor their self-progress (Good, 1973). Most importantly, students progress at

their own rates through the curriculum. Various forms of self-paced instruction have been used sporadically in classrooms throughout the United States since the mid-nineteenth-century (Kulik, 1982); thus, self-paced learning exists in some facets of contemporary school culture, most likely the result of historical developments within the past sixty years.

During the 1960s, educational venues experienced self-paced, programmed instructional materials, perhaps generated by B. F. Skinner's earlier position paper *The Science of Learning and the Art of Teaching* (1954). Skinner's work was written in part from the vantage point of parental frustration with the pedagogy observed through his daughter's mathematics classroom. One of the issues that Skinner (1954) noted in his paper was "the lack of a skillful *program* which moves forward through a series of progressive approximations to the final complex behavior desired" (p. 91). His perspective prompted discourse on how any learning could become ambiguous without a programmatic framework with an end-goal in mind.

After Skinner, individualized systems of instruction were developed and widely implemented at all levels of education (Gagne & Briggs, 1979). Systems such as Individually Prescribed Instruction (IPI) and the Personalized System of Instruction (PSI) relied on self-paced methods. These methods have since been incorporated into the development of Computer-Assisted Instruction (CAI) via the emergence of the personal computer in the 1980s, and most recently, the mobile device in the first decade of the twenty-first century. According to a 2015 Pew Research Center study, approximately 88 percent of United States teenagers (e.g., ages 13 to 17) possess or have access to a mobile phone, and a majority of teens (i.e., 73%) have smartphones (Lenhart, 2015). The proliferation of individual mobile devices, asynchronous collaboration opportunities, and time-variable courses liberate learning away from an exclusively group-paced format. This means that various forms of self-paced learning may differ from one

another in important instructional aspects. Self-paced instruction is a fundamentally embedded ideal within personalized learning environments where the learner accepts responsibility for pacing and timing to substantiate a mastery of content-area concepts and knowledge.

2.1.3   Current perspectives prompting changes in practice

Since the educational landscape has changed with the advent of charter schools and competition, I have observed that the culture has shifted to one of rapid change in practice, perhaps best served by imaginative leadership. The emergence of mobile devices in students' hands has caused a disruptive shift whereby educators are challenged by learning environments and strategies that are not yet fully vetted. Darling-Hammond (1993) stresses the need for all students to learn at high levels and views the task of instruction as that of enabling diverse learners to construct their knowledge and to develop their talents in useful and meaningful ways. She proffers that effective educators should be skilled at improvising and adapting their own teaching practices to address varying ability levels and diverse individual interests. Perhaps the most salient examples of effective educator practice are those that evidence significant flexibility within the professional practice of the instructor.

Across a body of literature, exploration of personalized learning practices reveals seven converging themes of research and educational practice, evident within the current educational landscape: the concept of mastery learning; the practice of diagnosing salient learning characteristics; an increasingly collegial school culture influencing systemic change; the practice of flexible scheduling; a focus on interdisciplinary design, the provision of professional development for teachers, and readily available technology for all students. These literature

items are provided here for analysis as "guiding supports" of personalized learning practices in the subsequent sections in Chapter 2.

2.2   GUIDING SUPPORTS DRAWN FROM LITERATURE

2.2.1   Emphasis on learning to mastery

Perhaps the most lacking area of contemporary instruction of the masses is the notion of comprehension of concepts to a mastery level. Standards-aligned systems dictate alignments such as eligible content and pace but tend not to specify the degree to which students should be able to demonstrate their learning of a given concept. Moreover, logistical constraints (e.g., bell schedules, school years) may end up being the final determiners of how much instructional time is given to all concepts. These constraints have the potential to stifle flexibility for teachers to accelerate and to modify learning experiences for advanced learners or to decelerate and expand remediation and re-teaching for learners who experience difficulty. It is important to note that both acceleration and deceleration should require rigor and struggle with content.

In United States schools, the term "Generation Y or GenY-ers" has been used to describe current school students, defined as children born after 1995. These individuals have been brought into a culture of frequent gratification on many social and experiential levels, perhaps caused by the influx of handheld technology and consistent access to the Internet. While one-to-one mobile computing implementations have brought about changes in teacher pedagogy, these initiatives have also affected student motivation and engagement (Bebell, 2005; Silvernail & Lane, 2004; Swan, van't Hooft, & Kratcoski, 2005). Another confounding feature of mobile

learning is how instructors assess the work of learners. Some classrooms achieve minimum learning towards mastery, but may result in at least a passing grade for the student. In other words, in some classrooms, it would be easier for a learner to just pass a test than to demonstrate mastery knowledge of individual concepts. Some could argue that instructional technique required to result in student skill mastery is contrary and divergent from the learning pathway that constructed the instructor's learning, potentially causing an unfortunate rift in expectations from both the instructor and learner perspectives.

2.2.2 Diagnosis of relevant learner characteristics

Educators regularly make decisions about the children whom they teach to assess their readiness to learn. Ostensibly, these decisions are centered on developmentally appropriate features of learning for a particular age or grade level. The assessment of group readiness is a traditional planning strategy, as opposed to assessment designed to personalize or individualize instruction. However, if educators are to meet the needs of every student in the classroom, the challenge then becomes 'how' to personalize learning in a way that attends to the learning readiness of the classroom, as a group, and as individual learners.

In the text *Thought and Language*, Vygotsky (1986) established the expression "zone of proximal development" or ZPD. This statement descriptively serves as a working definition for a student's intellectual readiness for attaining a learning task or concept. ZPD is one way to conceptualize the notion of learner readiness, but it is used very finitely to describe a discrepancy between what a student may accomplish independently as opposed to what the student would achieve with a skilled learning facilitator.

Perhaps instructors would postulate that the precise area of personalized learning is on a continuum of learner readiness from 'monotony' to 'apprehension' of the content being learned in which every learner is unique and different. Readiness levels across a classroom of students differ; therefore, the levels of challenge provided would need to vary as well (Tomlinson, 2003; Vygotsky, 1986).

To further the notion of learner readiness, it is important to note the discrepancy between readiness and student motivation. Csikszentmihalyi, Rathunde, and Whalen (1993) evidenced a strategic correlation distinctly between these two variables. Their study, involving over two hundred students, queried why some adolescents appear to attach to the development of perceived talents while others in their peer group disengage and neglect the same. Their conclusions portray a strong correlation between the complexity of the learning task(s) and the individual skill level of the learner.

Learners who possessed adequate skills in a non-challenging environment demonstrated low involvement in the learning task with a corresponding decrease in concentration and focus. In contrast, those learners who entered the learning task with minimal skill related to the actual task demonstrated low involvement, low achievement, and declining self-confidence. The authors concluded that a lack of challenge or stimulation of learning undermined learners in personal perceptions of their individual competence and confidence. The ideal learning experience is one of adequate skill and challenge. Further, the researchers found that instructors who effectively develop students' talents plan and design instructional activities that are commensurate with the learners' readiness level.

2.2.3 Collegial school culture influencing systemic change

The literature on the topic of Collegial School Culture seems to be organized around three major themes: change, culture, and curriculum. Educators hoping to create an environment of learning that is personalized to the student may view it as an opportunity to expand their own professional practice; however, this is a shift in culture that may be perceived as intimidating for teachers to implement. The discussion of a collegial school culture in support of personalized learning must ensue to empower educators to study personalized learning. For this reason, cultural change and curriculum modification will receive elaboration.

A focus on systemic change across the United States is currently guiding professional development programs centered on school reform, particularly in quantitative accountability measures of both students and educators. The catalysts for the reform efforts are often complex. Fullan (2000) summarizes his belief into a formula: $E = MCA^2$. The variable E refers to the rate of Efficacy of the system; M refers to the Motivation for reform (i.e., will, purpose, commitment) while C refers to the Capacity for reform (i.e., available resources, know-how, skills). A^2 refers to Assistance times Accountability (Fullan, 2000).

With the complexity of establishing "who" is responsible for exhibiting the reform in schools, Fullan's formula holds true today, as professional development is intimately associated with all tenets of this computation (2000). Expanding on the reform effort, the "who" also becomes of paramount importance influencing how educators measure the scope and scale of professional development. Coburn (2003) found that it is more challenging to measure conceptual change or enacted pedagogical principles than to record and quantify the presence or absence of activities or materials. Further, Coburn's study found it is more challenging to measure the spread of "norms of interaction" than the number of teachers or schools involved in

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an initiative (Coburn, 2003, p. 9). The scale of data collection when considered in the context of the moniker "school reform" has social and political implications, as public policy is driven by multitudes of data collected across schools, districts, intermediate units, states, and national regions.

2.2.4   Flexible scheduling

Most secondary schools design a "bell schedule" for students of four to eight periods of equal length; a typical student schedule specifies a time for travel between classes and provides time for serving and eating lunch. The concept of a bell schedule is premised on the factory-model of schools delivered on a nine-month schedule and influenced by an agrarian calendar of the nineteenth and twentieth centuries. Innovative notions, such as open education and non-graded schools, have inspired school leaders to implement flexible options for both students and teachers.

2.2.5   Interdisciplinary approaches

In addition to the innovation of flexible time schedules, interdisciplinary teaming was also brought into planning discussions as a catalyst to teach concepts that span multiple academic disciplines. Rickabaugh (2016) expresses flexibility in scheduling as an opportunity for learning, conveyed as a "sense of respect for what is important to students and supports them as they make responsible decisions" (p. 68). He further recognizes the notion of "anytime, anywhere learning" where educators may "support student learning…under a wide range of circumstances" inclusive of flexible time (p. 54).

What is more fascinating is that the concept of interdisciplinary teaming is not a new concept. During the 1960s and 1970s, this approach toward an interdisciplinary teaming was dubbed the Pontoon Transitional Design (PTD), an integral component of the NASSP Model Schools Project. PTD had a goal of developing a temporary "pontoon bridge" of time during the school day during which teachers gather in interdisciplinary groups with a goal of spanning the gap between educating mass numbers of students while personalizing education. It further served as a comprehensive model to inspire collaboration, placing responsibility for decision-making, scheduling, grouping, and cross-integration of academic content with teachers during the time afforded to the "pontoon" component of a school day (Georgiades, 1969).

2.2.6   Professional development for teachers

The process of establishing school culture where all stakeholders, especially educators, possess ownership and are motivated to receive professional development is a continuously evolving lens within the literature. Sociologist Dan C. Lortie (1975) in his book *Schoolteacher: A Sociological Study* expressed the complexity of schools and the educators that teach students within their walls. Specifically, he defined educators as possessing three characteristics which would have a significant impact on how they approach professional development. The first, "presentism," is a short-term perspective that prevents educators from envisioning or planning collaboratively for long-term, systemic change. The second, "conservatism," is a mistrust of reform initiatives and a reluctance to change everyday classroom practices, even in the face of research findings and pupil learning outcomes suggesting that better approaches are needed. The third, "individualism," is identified as teachers closing their classroom doors and working in isolation from colleagues and administrators, which has been linked to weak teamwork, lower levels of

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teacher efficacy and self-efficacy, less relational trust, failed innovations and reforms, and lower student achievement (Lortie, 1975).

Social cognitivist Albert Bandura (1986) identified four sources of self-efficacy: enactive mastery, vicarious experience, social/verbal persuasion, and physiological arousal. Related to school culture, and specifically to teacher professional development, is enactive mastery, which is a condition whereby educators rely on perceptions of past mastery to produce information that is used to make judgments about present capabilities (Bray-Clark & Bates, 2003). Educators may appreciate an opportunity to participate in professional development that will lead them to mastery of new teaching strategies and exposure to curriculum content before any leadership expectation for classroom implementation. When teachers are challenged to use their learning from professional development, and can do so successfully, they are more likely to use that learning when they return to a classroom setting (Bray-Clark & Bates, 2003).

The effectiveness of professional development has a strong interaction with curriculum structures in school, particularly when used in a specified content area. Penuel, Fishman, Yamaguchi, and Gallagher (2007), researching the implementation of a science curriculum, found the following:

> "a) There must be a good 'fit' between the curriculum and the local context, shaped partly by the effectiveness of the professional development activities; b) 'Fit' is also shaped by the ability of the professional development providers to meet the training needs of the teachers; and c) The coherence of the professional development is most effective when aligned to educators' professional goals and the goals for their students' learning." (p. 952)

Thus, meaningful professional learning has the potential to enhance positive school culture for educators.

In a quantitative study, Cwikla (2003) found that educator training focused on the National Council for the Teaching of Mathematics (NCTM) Standards had not yet explicitly described professional development activities related to teacher learning goals, nor did it specify an optimal training environment needed for teachers to maximize comprehension. Moreover, curriculum innovation could not be defined with fidelity until individual teacher learning goals were explicit. Subsequent empirical research on the methods to support teacher development and their respective learning environments could not accumulate until explicit goals were identified (Cwikla, 2003).

Each study within the body of literature reviewed here offers a contextual lens within the research that is presented. In whole, these findings are quite varied. It is fascinating to see, within the literature, a significant focus on the attributes of the human psyche when considering the teacher as learner. Professional development must be adapted accordingly to nurture individual human needs of teachers as adult learners. Not surprisingly, the educator becomes the learner when in the setting of professional development activities, and thereby, requires differentiation to make the experience personal and meaningful.

2.2.7 Personalized devices: Readily available technology for all students

While one-to-one mobile computing implementations have brought about changes in teacher pedagogy, these initiatives have also affected student motivation and engagement (Bebell, 2005; Silvernail & Lane, 2004; Swan et al., 2005). Bebell (2005) surveyed over four hundred seventh grade students and thirty-five teachers during the first six months of a one-to-one laptop program

in six schools in New Hampshire. The survey questions focused on access to, and use of, technology. He found that students almost doubled their use of the laptops during the implementation period across all the main subject areas. The teachers reported improvement in student participation, motivation, attendance, and their ability to work independently and in groups. Additionally, over ninety percent of teachers reported an increase in student engagement for both traditional and at-risk students. Students also displayed more effort in the quality of products they produced, were more willing to complete new drafts when assigned writing assignments, and seemed to work harder on classwork (Bebell, 2005).

Silvernail and Lane (2004) found similar results for student engagement when they evaluated the initial phase of the Maine Learning Technology Initiative (MLTI). The study used a mixed-method approach and analyzed over twenty-six thousand student surveys regarding the use of laptops to support instruction. It also included one thousand seven hundred parent surveys, along with site visits, observations, and document analysis. The researchers found that almost seventy percent of the students reported being "more involved in school and with their classmates" and that the laptops "made school more interesting" (Silvernail & Lane, 2004, p. 17).

For personalized learning to be efficient in today's school culture, it seems reasonable to predict that a learning device such as an iPad or Chromebook has the potential to enhance the learning experience; technology, however, brings a new and evolving set of leadership challenges. Implementing a one-to-one program can bring about several challenges for teachers and administrators working at a school. The issues that arise from these problems may cause teachers to become frustrated. These factors include time constraints, the amount of staff development required, problems with student behavior, and the lack of technical support (The

Abell Foundation, 2008; Brodzik, 2012; Rousseau, 2007).   Classroom management is an essential component needed to implement a successful one-to-one program (Brodzik, 2012).

Teachers with strong classroom management skills will have a higher chance of being able to change their curriculum to coincide with the introduction of technology (Brodzik, 2012). Researchers have found that even with clear discipline procedures, laptops in every student's hands can be a forum for a variety of challenges. Rousseau (2007) compared student discipline during one-to-one laptop programs in low- and high-socioeconomic (SES) schools in Maine. She collected qualitative data through observations and interviews and found significant behavior issues related to the laptops mainly in the low SES school. Students were intentionally damaging their laptops. Participants in the study reported abuses ranging from liquids being poured on the laptop to students "trying to round the edges by dragging it on the street out a moving car" (Rousseau, 2007, p. 131).

These distractions also occurred in the classroom setting. During an unstructured time, students were observed listening to music, accessing inappropriate websites, and instant messaging (Rousseau, 2007).   Tasgold (2012) found similar results from an analysis of experiences with one-to-one computing among teachers and students in a high school in North Carolina. She conducted interviews with sixteen students and three teachers and observed six classrooms. She found students using proxies to bypass Internet filters meant to keep them from accessing inappropriate websites. Students in the study also admitted that having the laptop encouraged off-task behaviors such as checking their emails or accessing social networking sites (Tasgold, 2012).

2.3   ALIGNMENTS TO CASE STUDY DESIGN

In case study design, research questions guide decisions regarding the subject to be studied, as well as help to craft a "blueprint" of how the case study will be conducted. Yin (2014) notes that "research design is much more than a work plan" (p. 29) and encourages researchers to avoid situations in which the evidence and outcomes do not correspond to the initially proposed research questions. He adds that an excellent research design should evolve to deal with a logical problem to be resolved. The actual design of a case study should not be viewed as a checklist or work plan. Yin encourages researchers to place whole focus on how the design impacts the research questions to be answered.

Yin (2014) creates a framework for a case study research design, placing emphasis in five areas: (a) study questions, (b) study propositions, (c) unit of analysis – "the case," (d) a logic that links data to propositions, and (e) criteria for interpreting the findings of the case study (p. 36). The first three components of the framework lead the researcher to identify data that are to be collected, whereas the lattermost two elements infer "what is to be done after the data have been collected" (p. 37).

When in the design phase of a case study, theory development is highly recommended. Yin (2014) encourages a straightforward theoretical statement from the outset of the initial research design and deliberation, to manifest strong fidelity and identifiable linkages to all five desired areas in the research design. Theory development is supported by a review of the literature surrounding the theory, those that are similar to the theory, and those that are divergent or are disadvantageous to the research design, as a way to eliminate those options for further study. Yin (2014) also employs the use of theory to generalize from other case studies, in an effort to build capacity for a depth of understanding of a researcher's own case study. He refers

to "analytic generalization" and "statistical generalization," both serving as strategies to compare and contrast the current case study design with lessons learned from other research projects. Analytic generalization refers to the role of a theory within a research design. In contrast, statistical generalization refers to how a researcher could comparatively simplify empirical data gleaned from other research, such as making an inference across an entire population, as compared to an individual sampling (Yin, 2014, p. 40). Researchers need to know the confidence in which they may extrapolate a theory's functionality from a small sampling of data, as compared to a large population of data. Yin (2014) denotes a "fatal flaw" when a case has a minimal sample size, which nullifies the ability for the sample to represent any larger population of data.

2.4   CRITIQUE OF CASE STUDY RESEARCH

Well-reviewed descriptive case studies, often in a narrative format, enable the researcher to engage complex projects and make them accessible in an attractive fashion for, at times, a non-researcher audience. The scope of the case study design is flexible and broad, ranging from brief summaries to annotated accounts. Case study enables a "storytelling" approach, whereas the researcher can propose the beginning of ideas, an exploration of what was observed, and sometimes "why," restate the goals of the research, delve into particular phenomena, and often present outcomes in their original complexity. The latitude to obtain varied forms of data gives the case study researcher an ability to explore new research ideas and discuss the evolving characteristics of a project.

Despite their advantages, case studies have received criticisms. Yin (2014) discusses three types of arguments against case study research. First, case studies are often accused of lack of rigor. Yin (2014) notes that, "Too many times, the case study investigator has been sloppy, and has allowed equivocal evidence or biased views to influence the direction of the findings and conclusions" (p. 20). Some critics note that case studies establish a minimal basis for scientific generalization since they use a small number of subjects. The question raised by Yin (2014) is "how can you generalize from a single case?" (p. 20). Tellis (1997) also explored a dependency on a single case exploration, finding it difficult to reach a generalizing conclusion.

Case studies are often identified as being too long, difficult to conduct and producing a massive amount of documentation (Yin, 2014). If analyzing a sampling of students over several years, a single researcher would be facing a monumental task of handling copious amounts of data in that timeframe. Data that are not managed and organized systematically become problematic and a menace to a thoughtful and precise outcome.

Yin (2014) considered case methodology "microscopic" as a result of the limited sampling cases. Yin, however, believes that establishing parameters and an appropriate research context are of paramount importance when compared to designing for a large sample size. The establishment of parameters, a well-organized plan for data collection, and clarity of context will be the goals of my methodology.

2.5   RATIONALE FOR THIS STUDY

In recent years, an increasing number of K-12 institutions are boasting the strategy of personalized learning, appearing to address individualized needs of students who have multiple

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learning styles. From John Dewey's (1907) "shift in the center of gravity" to the present-day shift in the locus of control from teacher to student, described by Peter Senge as the "discipline of personal commitment and mastery" (1990), attempts at implementation of *personalized learning* have persisted from initial iterations of programmed learning to the present-day Mass Customized Learning initiative which is augmented by new technology.

Although well-grounded in the belief that *personalized learning* is, and ought to be the goal, practical issues such as scheduling constraints, shortage of time, and limited resources have impeded attempts to implement a sustainable model to the fullest extent. Additional studies are needed to understand the full potential of *personalized learning* with twenty-first century technology and limited constraints.

During 2015, the Bill and Melinda Gates Foundation engaged the RAND Corporation to conduct research related to personalized learning. Sixty-two public schools, identified as predominantly urban/suburban, charter-driven, and of economically disadvantaged status committed to participate in this study (Pane, Steiner, Baird, & Hamilton, 2015). According to the report, student achievement was the focus of the study, providing a quantitative measurement of growth or regression within standardized assessments. The measurement was a comparison of different systems, a multitude of practices and varied learning environments, all three of which were viewed as "core attributes" of the research conducted.

What has not been studied as intently are the perceptions and beliefs of administrators and teachers that are working within schools that 'advertise' a personalized learning approach to their constituents, but are not following a prescribed organizational approach or research-tested methodology. These are the schools, particularly at the secondary-level, that interest me because there is a distinct possibility that the presence and notion of personalized learning in schools will

grow in popularity during the next decade. The business of schools is evolving, perhaps due to the competition of other learning environments, such as charter schools, cyber charter schools, learning centers (e.g., Sylvan and Huntingdon Learning Centers), all in concert with new devices and applications that encourage a single user to engage in technology-enhanced, student-centered instruction.

3.0   METHOD

3.1   INTRODUCTION

This case study examined a high school claiming to use personalized learning strategies. It focused specifically on the beliefs and practices of both teachers and principals. I will use the conceptual framework of guiding supports discussed in Chapter 2 as a lens for data collection and analysis. To illuminate and understand the qualities of the case, the study was conducted in two phases of inquiry. Participants from the high school participated in an online survey. Subsequently, the survey data was used as a filter to identify interview questions with both a teacher and a principal to understand better how their experiences related to various supports for implementation as defined in the literature review (See Section 2.2). The sections that follow serve to describe the case study design, identify the participants, and describe the methods used for data collection and analysis.

3.2   CONCEPTUAL FRAMEWORK

This case study focused on a proposed conceptual framework derived from the literature sources found in Chapter 2. As the literature review revealed, seven guiding supports have the potential to remove constraints and optimize opportunities for students to experience *personalized*

learning within schools: (a) emphasis on learning to mastery, (b) diagnosis of relevant learner characteristics, (c) collegial school culture supporting systemic change, (d) flexible scheduling, (e) interdisciplinary approaches, (f) professional development for teachers, and (g) readily available technology for all students.

The purpose of the study was to explore personalized learning through evidence indicating the presence or absence of these guiding supports derived from the literature. This case study examined a high school claiming to implement personalized learning practices. The high school demonstrated a commitment to implementing *personalized learning* strategies for students.

Sources of evidence used for the purpose of this study include survey data from teachers and principals as well as two follow-up interviews. Data types included perceptions of instructional delivery; scheduling practices; professional development practices; evidence of flexible scheduling within the master schedule, including teacher discretionary options for the use of instructional time; and documentation indicating availability and ease of access of mobile devices for all students. These descriptors of data sources align to the seven guiding supports derived from literature discussed in Chapter 2, as displayed in Figure 1.
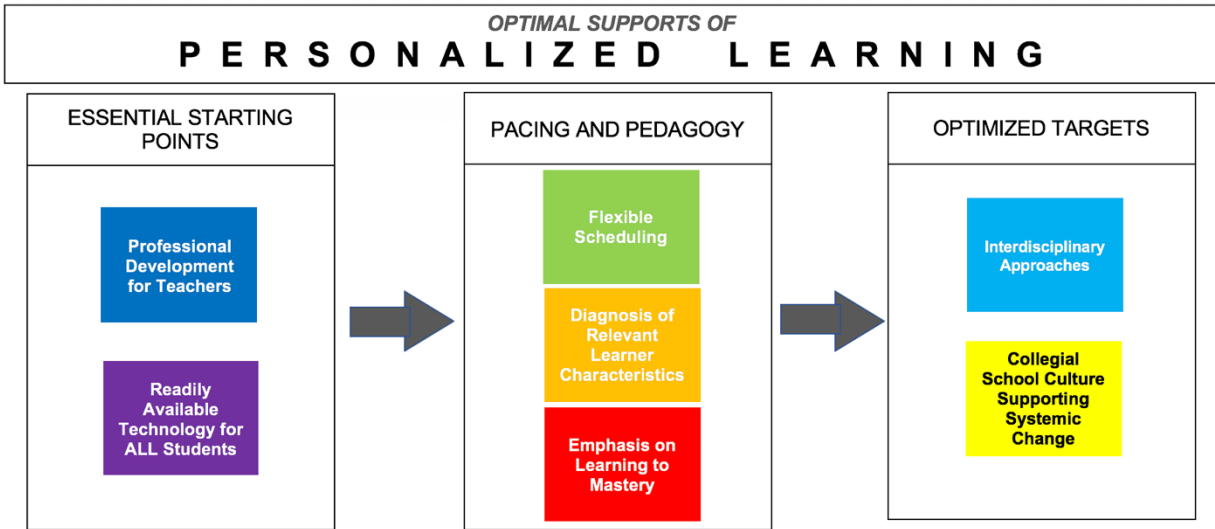
Figure 1: Conceptual Framework of Personalized Learning

This conceptual framework assisted with identification and categorization of evidence that personalized learning strategies are in place in the high school of study. Further, the conceptual framework served as a common reference between the researcher and the participants, to lead discussions and facilitate data collection related to personalized learning strategies observed in the participating high school.

3.3   RATIONALE FOR CASE STUDY METHODOLOGY

Contrary to Yin (2014), who would most likely recommend a narrow and regimented design for case study method, Stake (2005) argues for a flexible design, which would allow researchers to make major changes even after they proceed from their initially proposed design to the research itself. Merriam and Tisdell (2016) posit, "the single most defining characteristic of case study research lies in delimiting the object of study: the case" (p. 38). The "what" is a single entity

around which there are boundaries, able to "fence in what you are going to study" (p. 38). A broader and more flexible definition of cross-case analysis came from Miles, Huberman, and Saldaña (2014) when they described it as "a phenomenon of some sort occurring in a bounded context" (p. 28).

The proposition of personalized learning as a broadly defined "accepted" pedagogical strategy within education settings remains a question, perhaps due to its nebulous interpretation across constituencies. The study of what others perceive as "personalized learning," as well as how they juxtapose their own beliefs about pedagogy therein, served as the underpinning for a case analysis of the high school in this study. I chose case study methodology for this study due to its flexible design, its capacity to enable focus on a single entity, and its application to a "bounded context."

3.4   RESEARCH QUESTIONS

The research questions for this study are the following:

1. How is personalized learning described in a school professing to implement 'personalized learning?'

2. How does the concept of personalized learning in a school map onto seven guiding supports of personalized learning strategies drawn from the literature?

3.5   SETTING AND PARTICIPANTS

Teachers and administrators working in the Commonwealth of Pennsylvania was the baseline condition for establishing the participants of this study. The research was conducted in one such high school in the Central York School District, York County, Pennsylvania. I discussed this study with Dr. Michael Snell, Superintendent of the Central York School District and obtained his agreement for official participation in this study. There were two reasons for the selection of this school district. First, the school indicated that it markets personalized learning practices to its local constituency, encouraging several learning options within coursework at the school. The survey data initially collected served as a springboard into follow-up interviews to probe for nuances and uncover distinctive features of the school via coding in personal interviews. As recommended by Saldaña (2016), the plan for analysis of the participants' responses was to conduct coding as a "cyclical act" (p. 9). Saldaña elaborates that the first cycle of coding data is rarely, perfectly attempted: "the second cycle (and possibly the third and fourth, etc.) or recoding further manages, filters, highlights, and focuses the salient features of the qualitative data records for generating categories, themes and concepts, grasping meaning, and/or building theory" (p. 9). Second, Central York High School appeared to have created an energetic and novel academic experience for students, as guided by individual teachers. The goal was to draw from the experiences of both teachers and principals in their planning and delivery of their courses to date, in an associative examination with the seven guiding supports. I focused squarely on the practical work of teachers and principals who have chosen to provide their version of personalized learning practices to their students.

3.6 DESCRIPTION OF CENTRAL YORK HIGH SCHOOL

Central York High School (CYHS) houses approximately 1836 students in grades nine through twelve. CYHS is located in York, Pennsylvania, situated within York County in southcentral Pennsylvania. According to the Pennsylvania Department of Education (School Performance Profile, 2016), economically disadvantaged students represent 29% of the overall enrollment, with approximately 8% receiving special education services. The school is a near 50-50 composition of female and male students. Academic offerings include thirteen Advanced Placement courses, College in High School courses, and an intensive scheduling model (e.g., "block" scheduling), whereas students engage in learning periods of seventy-five minutes each. CYHS indicates that it offers personalized learning for students referenced within the Course Selection Guide as learning options:

> "**Self-paced:** Learners can move through the course at their optimal learning pace while receiving timely instruction from their teacher. Self-paced courses will have scheduled in and out of the classroom times with the teacher being available to the learners each day.
>
> **Online Course:** CYHS will offer online courses that mirror the courses provided in the traditional in-class course. These courses will be run through Schoology and are different from the Odysseyware online courses offered through the Central York Cyber School.
>
> **Project Based Learning:** These courses will focus on assessing learners through the use of projects to demonstrate mastery of the required skills and content.
>
> **Apollo:** Courses associated with the Apollo Program will have interconnected curriculums that allow for learner voice and choice in the development of their projects. Additionally, this program focuses on the development of thinking skills and soft skills in

an effort to increase a learner's critical thinking skills." (CYHS Course Selection Guide, p. 10)

CYHS additionally offers flexibility in scheduling where students have a "5th Block" option. If a student chooses to take five courses per semester instead of the typical four courses, this is possible across the day. If a student wishes to flexibly schedule his or her typical four courses earlier or later in the school day, this is possible as well. The school provides an embedded 45-minute flex period, for remediation and homework support, situated between Block 4 and Block 5 in the afternoon. Students are required to use web-based software as a catalyst to pairing up their learning needs with (a) the availability of a teacher as well as (b) the availability of peer tutors within the content area of need. Finally, all students are provided with a mobile device (e.g., iPad) for access to online portals.

3.7   INITIATION OF THE STUDY

Teachers and principals were invited to engage via an email invitation letter which was distributed throughout the high school by central office administration. This letter provided specific details about their involvement in the study. The survey was hosted by Qualtrics, an institutionally purchased resource for graduate student research at the University of Pittsburgh. The invitation letter included instructions as well as a shortened hyperlink accompanied by a Quick Response Code (QR code), directing participant electronic devices to the Qualtrics survey URL to be used in an Internet web browser. The web-based survey portal included a copy of the directions for the survey to ensure clear procedures and to minimize incorrect user interpretations of the survey content.

3.8   DATA COLLECTION AND ANALYSIS

Case study methodology was employed for the purposes of this research. I chose case study methodology to support data collection and analysis. Succinctly defined by researcher Robert Yin, case study research method is "an empirical inquiry that investigates a contemporary phenomenon within its real-life context; when the boundaries between phenomenon and context are not clearly evident; and in which multiple sources of evidence are used" (Yin, 1994, p. 23). Yin explains that in the experimentation world, scientists often look to explain phenomena in at least one of three schemes: by exploration, by description, or by explanation. Case studies are a form of social science research, often used when research questions are framed to examine "how" or "why" phenomena occur. Thoughtful data collection enhances case studies. For this reason, a case study is a practical method for completing evaluative work. Yin (2014) also insists that proper execution of case study research requires the investigators to elevate the process with rigor, as case study research "has classically been considered a 'soft' form of research" (p. 3). I applied Yin's approach to study the implementation of personalized learning strategies within Central York High School. This study included both survey data of teachers and principals and semi-structured follow-up interviews to further probe and extract additional details of respondent feedback related to the conceptual framework.

3.8.1   Survey data

I designed a survey instrument for this study, entitled *Survey of Personalized Learning Strategies in Secondary Schools* (see Appendix A). The instrument included questions that facilitated my collection of evidence across the seven guiding supports found in the literature in Chapter 2,

strategically aligning the conceptual framework to the data collection. The survey was constructed in Qualtrics, a web-based tool used to conduct survey research, that provides both teachers and administrators access to this survey via a hyperlink.

To determine the adequacy and thoroughness of survey questions, a pilot survey was administered to a sampling of teachers and principals at a neutral high school, one that is not included in the actual research process. The goal of this effort was to effectively vet the survey questions for clarity, assess expectations for participant responses, and predict the utility of the overall survey design for ease of use. All *pilot* survey participants were derived from public school teachers and administrators at the secondary level (e.g., grades 9-12) to maintain consistency within the high school being studied. The process of piloting the survey was intended to ensure clarity and user-friendliness, define nomenclature, and direct participants to explanative areas of the instrument. Feedback obtained prompted revision and restructuring of survey questions to increase accuracy in the data collection experience.

The survey was constructed around the emergent evidence of the seven guiding supports, as outlined in Table 1. The examples of evidence were posed as questions within the survey, serving the purpose to explore frequency of implementation of strategies. I used deductive coding to record information from interviews. For example, Learning to Mastery was coded as Guiding Support #1 (GS1) as recorded in the left column of Table 1.

Table 1. *Seven Guiding Supports Reflected as Examples of Evidence from Literature*

Conceptual Framework	
Guiding Support drawn from the Literature	Examples of Evidence
ESSENTIAL STARTING POINTS	
Professional Development for Teachers (Code: GS1)	1. Engage in intra-district professional development to support personalized learning 2. Engage in professional development for new teaching strategies and new curriculum content before expectation for classroom implementation 3. Engage in professional development specific to my content area 4. Participate in professional development aligned to my own professional goals and interests
Readily Available Technology for ALL Students (Code: GS2)	5. Have personal mobile devices (or 1:1 device programs) 6. Have technology available for students in classrooms 7. Provide devices for students to take home on a regular basis 8. Use technology to individualize instruction
PACING AND PEDAGOGY	
Flexible Scheduling (Code: GS3)	9. Follow flexible time schedules with students 10. Have control over time devoted to lessons and pacing as opposed to being bound to a strict bell schedule
Diagnosis of Relevant Learning Characteristics (Code: GS4)	11. Plan and design for instructional activities that are commensurate with the student's readiness 12. Use developmentally appropriate presentations for small groups 13. Ensure intellectual readiness of the learner 14. Ensure that every learner has appropriately challenging material for his/her skill level that is not the same as every other student 15. Adjust tasks for students' varying interest levels

Table 1 (continued)

Emphasis on Learning to Mastery (Code: GS5)	16. Customize instruction to the needs of the learner
	17. Differentiate delivery of instruction for various learning styles
	18. Use differentiated pacing for groups of students within a classroom
	19. Use learning contracts to provide for self-pacing and targeted independent practice
	20. Use formative assessment
	21. Alternative means for students to demonstrate mastery (e.g., use of projects, presentations)
	22. Use of multiple assessments to ensure mastery

OPTIMIZED TARGETS

Interdisciplinary Approaches (Code: GS6)	23. Have time for interdisciplinary teaming and planning for instruction across curricular areas
	24. Teach concepts through projects that span multiple academic disciplines
	25. Have scheduled time or available time during the school day for collaboration, decision-making, scheduling, grouping, and cross-integration of academic content
Collegial School Culture Influencing Systemic Change (Code: GS7)	26. Engage in collegial support to empower and enhance individual classroom practice
	27. Plan with colleagues and administration for long-term systemic change
	28. Engage in teamwork with colleagues
	29. Have a shared vision among teachers and administrators regarding professional goals for present and future

The survey instrument was designed to gather data on perceptions and beliefs of both principals and teachers regarding personalized learning strategies and to reveal evidence of guiding supports of personalized learning strategies as previously presented in the Conceptual Framework of Personalized Learning (see Figure 1). Using the conceptual framework, I sought to examine evidence of the presence of seven guiding supports, as well as explore the frequency

and intensity of their application in the participating high school. A summary of the alignments

of Research Questions 1 and 2 to data sources, survey items, and literature concepts is presented

in Table 2 along with a description of relevance and plans for data analysis.

Table 2. *Alignments to Research Questions 1-2*

		Alignments			
Study Questions	Data Sources	Survey Items	Relevance	Means of Data Analysis	Relevant Literature
<u>Research Question #1</u>: How is personalized learning in evidence within each of the schools professing to offer 'personalized learning?' <u>Research Question #2</u>: How does implementation of personalized learning in selected schools map onto seven guiding supports of personalized learning drawn from the literature?	Teacher/Principal Survey (Qualtrics) Interviews Document Analysis Note: The analysis of multiple data sources will generate implications for practice, to be discussed as findings in Chapter 7.	Emphasis on Learning to Mastery: Q7.1, Q7.2, Q7.3, Q7.4, Q7.5, Q7.6, Q7.7 Diagnosis of relevant learner characteristics: Q8.1, Q8.2, Q8.3, Q8.4, Q8.5 Collegial Culture Support Systemic Change: Q9, Q10, Q11, Q12.1, Q12.2, Q12.3, Q12.4 Flexible Scheduling: Q13, Q14 Interdisciplinary Approaches: Q15.1, Q15.2, Q15.3 Professional Development for Teachers: Q16.1, Q16.2, Q16.3, Q16.4 Readily available technology for all students: Q17, Q18, Q19, Q20	Seeks to provide a conceptual framework for schools that advertise and promote that "their" school is currently executing personalized learning strategies Gives insight to superintendents and community members regarding how personalized learning strategies are expressed somewhere in the school district Provides a detailed and thorough description of how each school "expresses" personalized learning strategies within its building/district Helps to summarize what the school believes and perceives *is* personalized learning. Gives insight to the researchers' understanding of practices within the schools, as a guiding light to compare and juxtapose with seven guiding supports	Conceptual Framework Frequency Distribution for each item; cross-tabulation based on variable Cross-tabulation of responses Coding of interviews Coding of document artifacts	• *Emphasis on Learning to mastery*: Senge (1990); • *Diagnosis of relevant learner characteristics:* Tomlinson (2003); Vygotsky (1986); Csikszentmihalyi et al. (1993) • *Collegial school culture supporting systemic change:* Fullan (2000); Coburn (2003); Bray-Clark & Bates (2003) • *Flexible scheduling:* Rickabaugh (2016) • *Interdisciplinary approaches:* Georgiades (1969) • *Professional Development for teachers:* Penuel et al. (2007), Cwikla (2003) • *Readily available technology for all students*: Bebell (2005); Silvernail & Lane (2004); Swan et al. (2005)

Relationships between the seven guiding supports identified in the literature-derived Conceptual Framework of Personalized Learning were key to examining and analyzing the high school. I was interested in examining perceptions and beliefs of both teachers and principals, related to how they infer personalized learning is happening in their school, in juxtaposition to what the literature specifies.

Survey data were analyzed to consider emergent patterns of personalized learning strategies in practice and compare them with concepts from the literature. The survey was intended to engage with quantitative data, collected in a tabular form, to examine the frequency of self-reported behaviors and perceptions. These data were collected from the participants via the Qualtrics survey engine.

In Chapter 4, a frequency distribution was used to quantify all survey responses. Frequency tables were used to disaggregate the data across seven guiding supports of personalized learning strategies. Cross-tabulation was used to compare and analyze the categorical alignments (e.g., seven guiding supports of personalized learning) across the survey responses.

3.8.2 Interview protocol

A second planned data collection activity was presented as an option on the survey for a follow-up interview (Survey Item Q21). Two participants volunteered. I conducted a semi-structured interview with these individuals, which indicated discrepant views regarding their school's implementation of personalized learning strategies. These interviews are presented in Chapter 5. The responses were analyzed regarding emergent patterns, and those will be compared to the

concepts from the literature. The interviews were structured with seven main questions, as listed below:

> *INTERVIEWER: "On survey question #6, you ranked your school's progress toward the goal of achieving full implementation of personalized learning strategies for all students as _____ percent. I will now ask you a series of seven (7) questions related to that response."*
>
> 1. *"What do you deem to be the essential components of your school's implementation to date?"*
>
> 2. *"What are the tasks yet to be addressed to achieve satisfaction with total implementation?*
>
> 3. *"As a school, what have teachers done to achieve this level of success?"*
>
> 4. *"As a school, what have administrators done to achieve this level of success?"*
>
> 5. *"Were you trained in personalized learning strategies <u>prior</u> to being expected to implement the strategies? If so, briefly describe your training."*
>
> 6. *"Were you trained in personalized learning strategies <u>during</u> the school's implementation phase? If so, briefly describe your training."*
>
> 7. *"What advice would you give to another high school in light of all that you have learned about the offering of personalized learning strategies to students?"*

I made an audio recording of each interview, which allowed me to create a thematic transcription and enabled me to extract patterns of responses that are coded in Chapter 5.

3.8.3 Document analysis

A third data source was relevant documentation from Central York High School. Specifically, I examined three documents that refer to personalized learning strategies found in the Central York High School or published by Central York School District. This included a mission statement, a marketing document, and a theoretical framework designed by the principal of the school. These documents served to exemplify patterns in the school's efforts related to personalized learning strategies in the literature. Specifically, these documents served a purpose to describe further the phenomena supporting the personalized learning conceptual framework in the school.

3.9   LIMITATIONS AND ASSUMPTIONS OF THIS STUDY

The data sources, a survey, interviews, and documentation provided by principals, were used to collect information from teachers and principals employed by Central York High School. Many teachers at the high school chose not to participate and ignored several requests for survey participation. I attempted to encourage participation by (a) designing the survey to be brief in format (i.e., less than fifteen minutes to complete) and (b) explaining the research project via email in advance of administering the survey. Through the survey, I queried participants for their willingness to participate in a follow-up interview. The intent of subsequent interviewing was to probe any recurrent themes in the survey data, engaging participants in a professional dialogue. To encourage further participation of teachers and principals, individual interviews were limited to thirty minutes or less. Only two individuals agreed to an interview.

An additional limitation was the potential of participants not responding with fidelity or honesty. In my position as a former teacher and building administrator, I anticipated reluctance to offer candid answers as survey participants may want to respond in a way that is deemed to be "correct" or preferable to what I may want to receive in the survey. To avoid this limitation, the introductory prompt of any data collection activities (e.g., survey, interview) included specific language that encouraged participants to reflect on their professional experience(s) to date, rather than posting their opinion without relevant experience.

The "Invitation to Participate in the Study" document explicitly stated that all data will remain confidential, will not be shared with any supervisory personnel, and will be used only for the context of this case study. The same disclaimer was verbally stated at the outset of individual interviews. I also chose to boost the confidence of the participant by explaining how the outcomes of this study will assist and inform other schools with future implementations of personalized learning strategies.

Participants may unintentionally presume that their understanding of personalized learning strategies is thorough and measurable when no standard may be able to gauge the effectiveness or efficacy of their strategies. For this reason, it was possible for participants believe that their strategies supersede those that are identified within the body of literature. These occurrences were highlighted and noted during the exposition and analysis of data from the case study in subsequent chapters.

3.10   ETHICAL ASSURANCES

Ethical assurance to all constituencies within the scope of this study was of paramount importance to me. I established survey and interview protocols that posed minimal risk to all participants involved. It was my intention to performing this study with dignity and honor to all participants.

Survey participants were not anonymous to the researcher for the sole purpose of arranging the follow-up interviews. Accordingly, participants were assured in the introductory meeting and in writing at the beginning of the survey that no personally identifiable data as a result of the survey and the interview will be reported in study outcomes or published findings. Interview participants were voluntary, as solicited from a specific participation question (Q21) on the survey instrument. Since all participants used their own time and effort to participate in this study, my goal is to distribute a summary of findings to the administration and faculty at Central York High School, with a courtesy copy of the findings provided to whoever expresses interest in the findings. The study design and instruments were approved through the University of Pittsburgh's Human Research Protections Office before initiation of the study.

3.11   PREVIEW OF SUBSEQUENT CHAPTERS

Through the collection of survey, interview, and documentation data, I planned to better understand the perceptions and beliefs of educators in a high school, concerning the school's methods and practice with personalized learning strategies. While this study aimed to investigate a high school's implementation of personalized learning strategies currently in place, it also

serves to test a conceptual framework of personalized learning, as constructed from literature. The knowledge gleaned from this study can potentially be used to build a thorough understanding of personalized learning strategies in secondary schools, mainly related to practice within the Commonwealth of Pennsylvania.

During the investigation, the goal was to examine how personalized learning strategies are in evidence within the high school professing to offer a personalized learning approach. The literature review was quite helpful in allowing me to propose a seven-guiding-support conceptual framework, as a lens for me to use to explore the alignment of the guiding supports with the practices in effect at the school. Subsequent chapters will help to describe phenomena collected and analyzed in this study.

4.0   DEVELOPMENT OF A CONCEPTUAL HEURISTIC

The term heuristic is often related to the study of mathematics and science, which according to the Merriam Webster dictionary, is defined as "involving or serving as an aid to learning, discovery or problem-solving by experimental and especially trial-and-error methods." (Merriam-Webster, 2018, online). This study by strategic design applies literature concepts to practices observed in a high school. The process of developing the heuristic is a focal point of interpreting and describing outcomes of this study.

The process through which to develop a heuristic on the topic of personalized learning is premised on a flexible design, pushing me to think beyond my initial ideas and allow for the development of multiple design scenarios. Morville (2017) is a known lecturer on the topic of user experience (UX). His professional work on UX is related to computing environments, social media, and websites. Morville uses a heuristic to establish experiential relationships, similar to the description and map features used in this study. A visual representation of Morville's user experience honeycomb is provided in Figure 2.

Figure 2. Morville's User Experience Honeycomb (2017)

Morville's heuristic is used to indicate value (valuable) in the user experience, in which descriptors (useful, useable, desirable, findable, accessible, credible) encircle the main concept of value. It serves a purpose to engage practitioners in *thinking about* the topic. Specifically, he states, "It's a great tool for advancing the conversation beyond usability and for helping people understand the need to define priorities." (Morville, https://semanticstudios.com/user_experience_design, 2017).

My use of a heuristic for assistance in understanding the need to define personalized learning may be similar to Morville's approach. In Chapter 3, I proposed a literature-based conceptual framework to design this study's terms and conditions and subsequently engage in data analysis. I believe that while the framework serves this study of a school district, the ability to provide a heuristic has the potential to initiate further thinking and discussion on this topic. It also has the potential to energize an ongoing conversation about defining personalized learning.

Use of a heuristic could allow researchers and practitioners to reorder priorities, discuss relationships across features, and seek practical understanding of sequencing. The Central York High School highlighted in this study could use the conceptual framework to engage in their own

future deliberations on the topic. However, a conceptual heuristic, one that is malleable and flexible to initiate multiple scholarly and practitioner perspectives and has the potential to guide educators to better understanding of how personalized learning could be applied in practice.

It is possible that the literature-based guiding supports discussed throughout Chapters 2 and 3 can be reordered. It is also possible that these same supports could vary in their intensity of use and priority of implementation when situated within an educational setting. In order to liberate discussion, participants within the educational setting would agree that, dependent on the context of implementation, the details and design of the heuristic would be fluid and adaptable. If there is to be any central focal point of the heuristic, it could be the definition and discussions surrounding personalized learning. The hope is that conversations further inform the design of the heuristic, making it flexible, expandable, and variable in relationship to deliberations among practitioners and scholars.

Chapter 5 analyzes the data used to describe and map concepts focused on a definition of personalized learning. The literature-based concepts held firmly in support of actual practice, based on the observation of the data. This further indicates potential for a heuristic to help organized meaningful conversation among stakeholders, to engage in strategic planning of institutional goals and also identify opportunities and processes that assist in ongoing evaluation practices. A heuristic could address the specific needs of institutional learning practices, in the setting and context of a particular entity, further addressing the needs of the practitioners in a way that a "model" could not. It is necessary to anticipate that analysis and synthesis of this study's data could further support the use of a heuristic, potentially as a finding to this study.

5.0   DATA ANALYSIS

This chapter examines the survey data collected during this study, which is reported using frequency distribution tables for the survey data, and descriptive narrative for the qualitative data. In order to address both research questions, a participant population needed to be identified. The population for this study was the faculty members and administrators currently employed at Central York High School. These individuals were provided with a hyperlink to participate in the survey. Of those who responded to the survey (n=35), four participants indicated an interest on the survey to participate in follow-up interviews. After several attempts to contact all the interested interviewees, only two individuals responded affirmatively to schedule and subsequently complete an interview. Interview data are presented in Chapter 5. For a visual representation that outlines this study's population and sample, see Figure 3.
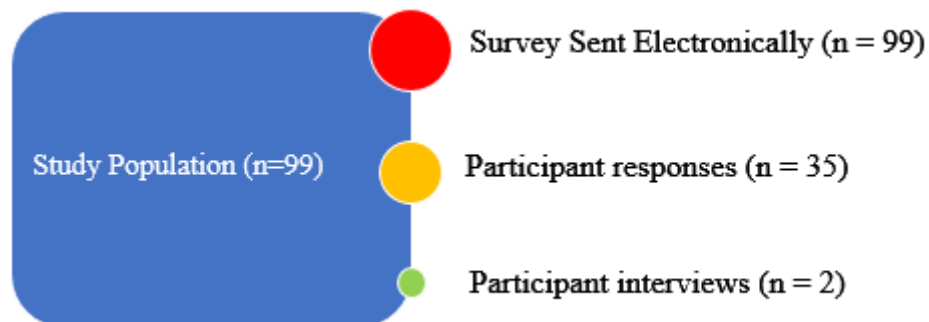
Figure 3. Study Population versus Participant Response and Interviews

5.1   DEMOGRAPHIC DATA

Chapter 5 begins with a description of the demographic data collected. As previously stated, 35 participants started and completed the survey for this study, constructing the bulk of the data set used for analysis purposes. In order to complete a comprehensive view of the data, interviews were also conducted (n=2) and are presented in Chapter 5. Demographic information is reported for both the survey participants and the participants of the interviews.

Survey question one (Q1) asked participants to identify their current position of employment. Teachers represented 85.7% of respondents (n=30), with the remainder of the sample consisting of administrators (14.3%, n=5). **Survey question 2 (Q2)** asked participants to identify their current teaching assignment, outlined in Table 3.

Table 3. *Content Areas of Current Teaching Assignment*

Certification Area	Number of Participants (Total n=35)
English Language Arts	7 (20.0%)
Social Sciences	5 (14.3%)
Special Education	5 (14.3%)
Administrative	4 (11.4%)
Mathematics	3 (8.6%)
Business, Computer and Information Technology	2 (5.7%)
Library Science	2 (5.7%)
School Counselor	2 (5.7%)
Technology Education	2 (5.7%)
Art	1 (2.9%)
Science	1 (2.9%)
World Languages	1 (2.9%)

Survey question three (Q3) asked participants to indicate their highest level of education, to date. Twenty percent of respondents (n=7) have a Bachelor's degree, 77.1% of participants have a Master's degree (n=27), and 2.9% have a Doctoral degree (n=1). Survey questions 4 and 5 asked participants to indicate their total number of years of experience in education and their total number of years worked at Central York High School, respectively.

Survey data were collected to consider emergent patterns of personalized learning strategies in practice and compare them with concepts from the literature. The survey was intended to engage with quantitative data, collected in a tabular form, to examine the frequency

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of self-reported behaviors and perceptions. These data were collected from the participants via the Qualtrics survey engine and has been analyzed for descriptive features and statistics. According to response to survey **question one (Q1)**, thirty (30) teachers and five (5) administrators participated in the study for a total of thirty-five (35) participants. This represents a response rate of 35.5%, which is derived by dividing the participant sample from a total population of 99 individuals identified as either a teacher or administrator working at CYHS. Several frequency distributions outline the demographic attributes of the participant sampling and quantify the number of all survey responses.

Relationships between the seven guiding supports identified in the literature-derived Conceptual Framework of Personalized Learning are key to examining the high school undergoing study. I examined the perceptions and beliefs of both teachers and administrators, related to how they believe personalized learning is happening in their schools, in juxtaposition to what the literature specifies.

Table 4. *Level of Education Attained*

Level of Education Attained (Q3)	Bachelor's Degree	Master's Degree	Doctoral Degree
n=35	7 20.0%	27 77.1%	1 2.9%

As indicated in Table 4, the predominant level of the education across the survey participants is the Master's degree, representative of 27 of 35 respondents (77.1%). Tables 5 and 6 show the total number of years worked in education as well as the total number of years worked at Central York High School (CYHS), respectively.

Table 5. *Total Number of Years Worked in Education*

Total Number of Years Worked in Education (Q4)	0-5 Years	6-10 Years	11-15 Years	16-20 Years	21-25 Years	26-30 Years	31-35 Years	36+ Years
n=35	4	8	8	6	5	2	1	1
	11.4%	22.9%	22.9%	17.1%	14.3%	5.7%	2.9%	2.9%

Table 5 indicates the greatest mode of participants exists at the categories of 6-10 years and 11-15 years. Assuming a 35-year career in education, the data infers that participants are employed early in their career to an upper range of mid-career.

Table 6. *Total Number of Years Worked at Central York HS*

Total Number of Years Worked at CYHS (Q5)	0-5 Years	6-10 Years	11-15 Years	16-20 Years	21-25 Years	26-30 Years	31-35 Years	36+ Years
n=35	9	9	10	6	1	0	0	0
	25.7%	25.7%	28.6%	17.1%	2.9%	0.0%	0.0%	0.0%

Table 6 indicates the greatest mode of participants exists at the category of 11-15 years.

For **question six (Q6)**, participants were asked this opening question to the survey: "Personalized Learning is described as 'a vision where learning systems may abandon the industrial, time-based approach to instruction and replace it with a contemporary learning-based

system that fulfills every learner's need at his/her present performance level.' Using this description, with zero representing no implementation and 100 representing complete implementation, how close is your school to achieving the goal of implementing personalized learning for all students?" Figure 4 displays numbers of respondents per response choice.
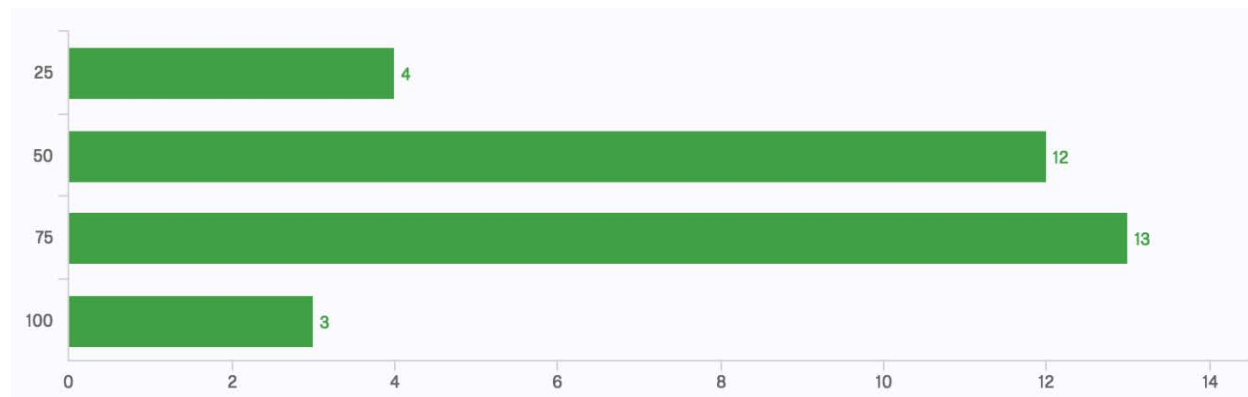
Figure 4. Belief Question: Goal of Personalized Learning Implementation

Of the 35 participants, the mean aggregated response choice was 61.7, indicating a perception of implementation slightly beyond the midpoint. The highest mode of participant response was 75% (n=13).

5.2   CONCEPTUAL FRAMEWORK AREA #1: ESSENTIAL STARTING POINTS

Subsequent to the demographic data section (Q1 through Q6), the survey queries made a distinctive shift to prompt data reflections directly related to the Conceptual Framework of Personalized Learning outlined in Chapter 3. It is important to note that the survey questions in these sections are not sequential. The question number is provided as a data reference for

appendices at the end of this dissertation document. Section 4.2 examines a section of Essential

Starting Points of topics gleaned from the literature on Personalized Learning.

5.2.1   Professional development for teachers

Four (4) survey questions were included to gather perception data regarding professional

development practices. This section includes questions 9, 10, 11 and 16. **Question nine (Q9)**

asked participants: "My District provides time in the work week for shared collaboration (e.g.,

Professional Learning Community, common planning time)." There were 29 responses to this

question (n=29), slightly less than the overall participant sample (n=35). Table 7 displays the

distribution of responses.

Table 7. *Provision of Shared Collaboration Time During the Work Week*

My District Provides Collaboration Time	Yes	No
n=29	19 65.5%	10 34.5%

Question ten (Q10) asked participants "How much time is provided on a weekly basis to

you intended for collaboration with colleagues?" There were 28 responses to this question

(n=28). Table 8 represents the distribution of responses.

Table 8. *Amount of Weekly Collaboration Time Provided*

Weekly Collaboration Time Provided	None	1-20 minutes	21-40 minutes	41-60 minutes	61-80 minutes	81-100 minutes	101-120 minutes	121+ minutes
n=35	7	3	5	6	1	1	1	4
	25.0%	10.7%	17.9%	21.4%	3.6%	3.6%	3.6%	14.3%

Table 8 indicates the greatest mode of participants exists in the category of "none." There appears to be differing perceptions of how much time is provided, or perhaps differing amounts of time may be provided to individual teachers.

Question eleven (Q11) asked participants to rate their satisfaction with collaboration time. Specifically, the question was stated as, "With zero representing no collaborative time and 100 representing complete satisfaction with collaborative time, to what extent do you think that the collaborative time provided with colleagues is adequate?" Responses are displayed in Figure 5.
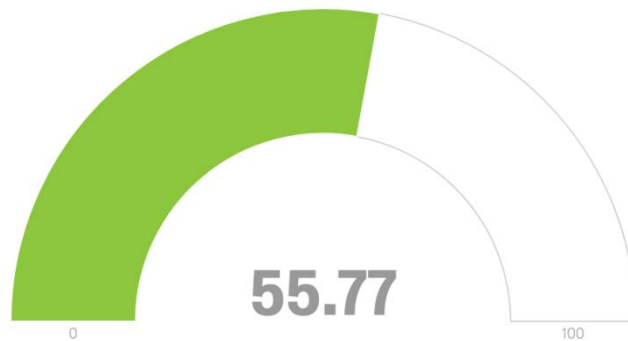
Figure 5. Adequacy of Collaboration Time

Of the 35 participants to Question 11, the mean aggregated response choice was 55 (SD=27.13), indicating a perception of adequate collaboration time is slightly beyond the midpoint. The highest mode of participant response is 50% (n=9).

Question sixteen (Q16) asked participants to "assess to what extent you engage with professional development activities as defined in the descriptions below." Table 9 outlines the data collected from the participants.

Table 9. *Frequency of Implementation of Professional Development*

Question	I have never implemented this practice	I occasionally implement this practice (at least 1x per month)	I frequently implement this practice (at least 1x per week)	I regularly implement this practice (at least 1x per day)	Total Responses (n)
Q16.1 Engage in intra-district professional development to support personalized learning	7 26.9%	17 65.4%	0 0.0%	2 7.7%	26
Q16.2 Engage in professional development for new teaching strategies and new curriculum content prior to any expectation of classroom implementation	7 26.9%	16 61.5%	2 7.7%	1 3.9%	26
Q16.3 Engage in professional development specific to my content area	8 30.8%	11 42.3%	4 15.4%	3 11.5%	26
Q16.4 Participate in professional development aligned to my own professional goals and interests	5 19.2%	13 50.0%	6 23.1%	2 7.7%	26

The data indicate that professional development activities predominantly occur at least a once per month. A few participants indicate a higher frequency of occurrence, but no pattern indicates weekly or daily professional development as a consistent event.

5.2.2 Readily available technology for all students

Four (4) survey questions were included to gather perception data regarding student technology access. This section includes questions 17, 18, 19, and 20.

Question seventeen (Q17) asked participants, "Does each student has access to a mobile device (e.g., laptop, iPad, Chromebook) in their classroom for daily use?" Of 28 participants, 100.0% (n=28) answered YES. **Question seventeen (Q18)** asked participants, "May students take their mobile device home on a regular basis?" Of 28 participants, 100.0% (n=28) answered YES. **Question nineteen (Q19)** asked participants, "Do students have access to a learning management system (e.g., Moodle, Schoology, etc.) to engage with academic content?" Of 28 participants, 100.0% (n=28) answered YES. The three questions support Central York's claim that students access and participate in a take-home mobile device program.

Question twenty (Q20) asked participants, "With zero representing no individualized instruction and 100 representing complete satisfaction with student individualized instruction, to what extent do you think that the individualized instruction as a result of technology usage is adequate?" Figure 6 displays the response data reflecting participant perceptions of adequacy in technology usage.

Figure 6. Adequacy of Technology Usage

Of the 28 participants to question twenty (Q20), the mean aggregated response choice was 66.67 (SD=27.13), indicating a perception of adequate technology usage is a ratio of 2 to 1. The highest mode of participant response is at both 50% (n=10) and 75% (n=10) choice designations, respectively.

5.3   CONCEPTUAL FRAMEWORK AREA #2: PACING AND PEDAGOGY

Whereas professional development for teachers and access for students to mobile devices are arguably necessary starting points, there are other supports identified in the literature from Chapter 2 that have the potential to support personalized learning. The survey was designed to collect data related to practices around (a) Flexible Scheduling, the (b) Diagnosis of Learner Characteristics, and the (c) Learning to Mastery. Subsections of this section outline collected data.

5.3.1 Flexible scheduling

Question thirteen (Q13) asked participants, "With zero representing no control and 100 representing complete satisfaction with your current level of control, to what extent do you have control over time devoted to teaching lessons and providing individualized pacing for students, as opposed to the boundaries of the bell schedule?" Figure 7 provides a graphical representation of the response data.
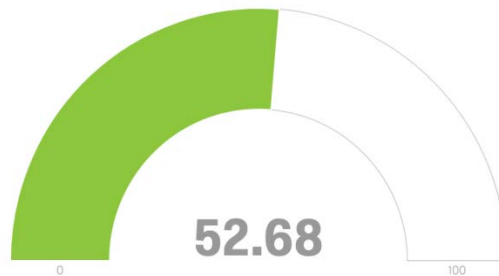
Figure 7. Current Level of Satisfaction with Instructional Control

Of the 28 participants to question twenty (Q20), the mean aggregated response choice was 52.68%, indicating a perception of approximately half of the sample. The highest mode of participant response is at the 75% (n=10) choice designation.

Question fourteen (Q14) asked participants, "With zero representing no student schedule flexibility and 100 representing complete satisfaction with student schedule flexibility, to what extent do you think that the flexibility in student scheduling is adequate?" Figure 8 displays the response data.
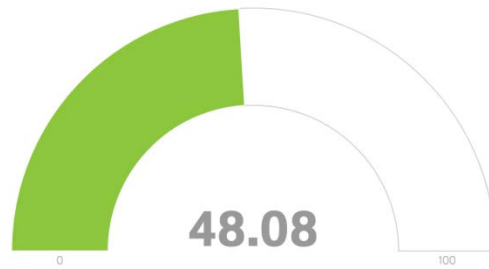
Figure 8. Adequacy of Student Scheduling Flexibility

Of the 26 participants to question twenty (Q20), the mean aggregated response choice was 48.08%, indicating a perception of approximately half of the sample. The highest mode of participant response is at the 50% (n=13) choice designation.

5.3.2 Diagnosis of learner characteristics

Question eight (Q8) asked participants, "Assess to what extent you diagnose relevant learner characteristics as defined in the descriptions below. Table 10 displays the response data.

Table 10. *Frequency of Diagnosing Relevant Learner Characteristics*

Question	I have never implemented this practice	I occasionally implement this practice (at least 1x per month)	I frequently implement this practice (at least 1x per week)	I regularly implement this practice (at least 1x per day)	Total responses (n)
Q8.1 Plan and design instructional activities that are commensurate with the student's readiness	1 3.7%	4 14.8%	11 40.7%	11 40.7%	27
Q8.2 Use developmentally appropriate presentations for small groups	3 11.1%	6 22.2%	9 33.3%	9 33.3%	27
Q8.3 Ensure intellectual readiness	4 15.4%	3 11.5%	10 38.5%	9 34.6%	26
Q8.4 Ensure that every learner receives challenging material individually matched to his/her skill level	2 7.7%	7 26.9%	10 38.5%	7 26.9%	26
Q8.5 Adjusts tasks (e.g., assignments, projects, presentations) for students' varying interest levels	2 7.1%	5 17.9%	13 46.4%	8 28.6%	28

The highest frequency (mode) of each categorical response indicates the most frequent trend of the responses. Three of the five areas (i.e., Q8.3, Q8.4, and Q8.5) indicate a predominant implementation of practice of at least once per week. In contrast, category Q8.1

(i.e., "Plan and design instructional activities that are commensurate with the students' readiness") and category Q8.2 (i.e., "Use developmentally appropriate presentations for small groups") indicates frequency equally distributed between once per week and once per day, representing that the latter categories would be observed more frequently in the school, as reported by the participants.

5.3.3   Learning to mastery

Question seven (Q7) asked participants to "assess to what extent you implement students learning to mastery as defined in the descriptions." Table 11 displays the response data.

Table 11. *Frequency of Implementation for Student Learning to Mastery*

Question	I have never implemented this practice	I occasionally implement this practice (at least 1x per month)	I frequently implement this practice (at least 1x per week)	I regularly implement this practice (at least 1x per day)	Total Responses (n)
Q7.1 Customize instruction to the needs of the learner	0 0.0%	3 10.3%	13 44.8%	13 44.8%	29
Q7.2 Differentiate delivery of instruction for various learning styles	0 0.0%	5 17.2%	13 44.8%	11 37.9%	29
Q7.3 Use differentiated pacing for groups of students within your classroom	1 3.6%	11 39.3%	7 25.0%	9 32.1%	28
Q7.4 Use learning contracts to provide for self-pacing and targeted independent practice	8 29.6%	8 29.6%	8 29.6%	3 11.1%	27
Q7.5 Use formative assessment	3 10.7%	4 14.3%	9 32.1%	12 42.9%	28
Q7.6 Offer alternative means for students to demonstrate mastery, such as projects or presentations	4 14.3%	6 21.4%	11 39.3%	7 25.0%	28
Q7.7 Use multiple assessments to ensure mastery	1 3.6%	7 25.0%	13 46.4%	7 25.0%	28

Related to Student Learning to Mastery, participants report similarity in frequency of response data across more than one category. Participants report practices of once per week for Q7.2 (i.e., "Differentiate delivery of instruction for various learning styles"), Q7.6 (i.e., "Offer alternative means for students to demonstrate mastery, such as projects or presentations"), and Q7.7 (i.e., "Use multiple assessments to ensure mastery"). Participants report that Q7.1 (i.e., "Customize instruction to the needs of the learner") indicates frequency at least once per week to once per day, and Q7.5 (i.e., "Use formative assessment") is the most frequently reported practice, with nearly half of participants implementing this practice at least once per day. In contrast, Q7.3 (i.e., "Use differentiated pacing for groups of students within your classroom") and Q7.4 (i.e., "Use learning contracts to provide for self-pacing and targeted independent practice") are the least reported practices.

5.4   CONCEPTUAL FRAMEWORK AREA #3: OPTIMAL TARGETS

A final set of targets derived from literature in Chapter 2 provides an optimized target for personalized learning to be described in a school. Several questions on the survey were designed to collect data regarding 1) Interdisciplinary Approaches in classrooms and 2) Engaging in and Sustaining a Collegial Culture. The following subsections outline the collected data.

5.4.1 Interdisciplinary approaches

Question fifteen (Q15) asked participants to "assess to what extent you engage in the practice of interdisciplinary instruction as defined in the descriptions below." Table 12 displays the response data.

Table 12. *Frequency of Implementation of Interdisciplinary Approaches*

Question	I have never implemented this practice	I occasionally implement this practice (at least 1x per month)	I frequently implement this practice (at least 1x per week)	I regularly implement this practice (at least 1x per day)	Total Responses (n)
Q15.1 Have time for interdisciplinary teaming and planning for instruction across curricular areas	6 22.2%	13 48.2%	4 14.8%	4 14.8%	27
Q15.2 Teach concepts through projects that span multiple academic disciplines	7 25.9%	12 44.4%	5 18.5%	3 11.1%	27
Q15.3 Have scheduled time during the school day for collaboration, decision-making, scheduling, grouping, and cross-integration of academic content	9 33.3%	9 33.3%	5 18.5%	4 14.8%	27

Most respondents report using interdisciplinary practice once per month. Approximately one fourth of the participants indicate never implementing interdisciplinary approaches in their teaching, a notable feature in the data.

5.4.2 Engaging in and sustaining a collegial culture

Question twelve (Q12) asked participants to "Assess to what extent you engage in the practice of sustaining a collegial school culture as defined in the descriptions below." Table 13 outlines the data collected from the participants.

Table 13. *Frequency of Implementation of Engaging in and Sustaining a Collegial Culture*

Question	I have never implemented this practice	I occasionally implement this practice (at least 1x per month)	I frequently implement this practice (at least 1x per week)	I regularly implement this practice (at least 1x per day)	Total Responses (n)
Q12.1 Engage in collegial support to empower and enhance my classroom practice	2 7.4%	7 25.9%	12 44.4%	6 22.2%	27
Q12.2 Plan with my colleagues and administration for long-term systemic change	3 11.1%	13 48.2%	7 25.9%	4 14.8%	27
Q12.3 Engage in teamwork with colleagues	1 3.6%	9 32.1%	9 32.1%	9 32.1%	28
Q12.4 Have a shared vision among teachers and administrators regarding goals for the present and future	2 7.1%	13 46.4%	10 44.4%	3 22.2%	28

Participant responses related to collegial culture are mixed. While participants report Q12.2 (i.e., "Plan with my colleagues and administration for long-term systemic change") and Q12.4 (i.e., "Have a shared vision among teachers and administrators regarding goals for the present and future") as occurring at least once per month, there are differing responses in the remaining two categories. The data indicates that Q12.3 (i.e., "Engage in teamwork with colleagues") is reported as equally distributed from once per month to once per day, implying that this practice may be *inconsistently* applied in practice among the participants.

5.5   GENERALIZED FEEDBACK RELATED TO GUIDING SUPPORTS

Several concluding questions were posed in the survey to generate a generalized perspective from all participants, to further probe the priority of guiding supports designed into the conceptual framework. For **Question 21 (Q21)**, participants were asked how they would rank order the importance of the guiding supports for personalized learning. There were 22 responses to this question (n=22). To enable further analysis in Chapter 6, this question will be presented with data separated from teacher participants (n=17) and principal participants (n=5). Table 14 outlines the data. Note: boldface type indicates the highest frequency in the rank ordering.

Table 14. *Teacher Ranking of Guiding Supports*

Guiding Support-Teachers (n=17)	Rank Order 1	Rank Order 2	Rank Order 3	Rank Order 4	Rank Order 5	Rank Order 6	Rank Order 7
Professional Development for Teachers	3	**4**	2	1	2	3	2
	17.7%	**23.5%**	11.8%	5.9%	11.8%	17.7%	11.8%
Readily Available Technology for ALL Students	2	**4**	**4**	0	2	3	2
	11.8%	**23.5%**	**23.5%**	0.0%	11.8%	17.7%	11.8%
Flexible Scheduling	0	0	2	4	4	**5**	2
	0.0%	0.0%	11.8%	23.5%	23.5%	**29.4%**	11.8%
Diagnosis of Relevant Learner Characteristics	**4**	**4**	1	**4**	1	1	2
	23.5%	**23.5%**	5.9%	**23.5%**	5.9%	5.9%	11.8%
Emphasis on Learning to Mastery	3	2	3	1	**5**	2	1
	17.7%	11.8%	17.7%	5.9%	**29.4%**	11.8%	5.9%
Interdisciplinary Approaches	1	2	2	3	2	2	**5**
	5.9%	11.8%	11.8%	17.7%	11.8%	11.8%	**29.4%**
Collegial School Culture Influencing Systemic Change	**4**	1	3	**4**	1	1	3
	23.5%	5.9%	17.7%	**23.5%**	5.9%	5.9%	17.7%

By grouping the top two rank ordered selections, teachers indicate their highest priority in two guiding support areas: <u>Diagnosis of Relevant Learner Characteristics</u> and <u>Collegial School Culture Influencing Systemic Change</u>. Applying the same procedure to the bottom two rank ordered selections, teachers indicate <u>Flexible Scheduling</u> and <u>Interdisciplinary Approaches</u> as their least prioritized guiding supports.

Examining principal ranking yields a different outcome. Principal participants reported a prioritized rank order of the guiding supports for personalized learning, as presented in Table 15.

Table 15. *Principal Ranking of Guiding Supports*

Guiding Support-Teachers (n=17)	Rank Order 1	Rank Order 2	Rank Order 3	Rank Order 4	Rank Order 5	Rank Order 6	Rank Order 7
Professional Development for Teachers	**2** 40.0%	**2** 40.0%	0 0.0%	1 20.0%	0 0.0%	0 0.0%	0 0.0%
Readily Available Technology for ALL Students	**2** 40.0%	0 0.0%	0 0.0%	**2** 40.0%	0 0.0%	0 0.0%	1 20.0%
Flexible Scheduling	0 0.0%	0 0.0%	1 20.0%	0 0.0%	**2** 40.0%	**2** 40.0%	0 0.0%
Diagnosis of Relevant Learner Characteristics	0 0.0%	1 20.0%	1 20.0%	1 20.0%	**2** 40.0%	0 0.0%	0 0.0%
Emphasis on Learning to Mastery	0 0.0%	1 20.0%	0 0.0%	1 20.0%	0 0.0%	**3** 60.0%	0 0.0%
Interdisciplinary Approaches	0 0.0%	0 0.0%	0 0.0%	0 0.0%	1 20.0%	0 0.0%	**4** 80.0%
Collegial School Culture Influencing Systemic Change	1 20.0%	1 20.0%	**3** 60.0%	0 0.0%	0 0.0%	0 0.0%	0 0.0%

By grouping the top two rank ordered selections, principals indicate their highest priority in two guiding support areas: Professional Development for Teachers and Readily Available Technology for ALL Students. Applying the same procedure to the bottom two rank ordered selections, principals indicate Emphasis on Learning to Mastery and Interdisciplinary Approaches as their least prioritized guiding supports. Analysis of the prioritization among teachers and principals will be addressed in Chapter 6.

5.6   LOOKING AHEAD

In Chapter 5, interviews of both a teacher and a principal highlight the description of personalized learning at Central York High School. In addition, the next chapter analyzes several document artifacts provided by the high school, in relation to the seven guiding supports framed in this study.

5.7   INTERVIEW #1: TEACHER

The teacher currently employed by Central York High School (CYHS) in a classroom setting. On the survey, the teacher indicated that 21-25 years of total public school experience and that they have been working at CYHS for the past 11-15 years. The teacher has earned a Masters' degree.

5.7.1   Essential starting points

It was interesting for me to note that the context of this section of the interview was primarily focused on professional development. Further, survey questions 17 through 19 were related to access of mobile devices and a learning management system.   Survey respondents had overwhelmingly responded (i.e., 100%, n=28) that technology access for students is in place. The focus with the teacher shifted to a discussion about professional development perceptions. A visual representation of the data collected in the Essential Starting Points category for the teacher's interview is displayed in Table 16.

Table 16. *Essential Starting Points - Coding Associated to the Teacher's Interview*

ESSENTIAL STARTING POINTS	
Professional Development for Teachers (Code: GS1)	Readily Available Technology for ALL Students (Code: GS2)
3. Engage in professional development specific to my content area	No data observed in interview.
4. Participate in professional development aligned to my own professional goals and interests	

5.7.1.1 Professional development for teachers (GS1)

The teacher described past history with professional development by stating, *"I really feel our faculty has sort of been thrown to the sharks to sort of figure it out for themselves."* She indicated advantages and disadvantages to this process, in that individual teachers have the advantage to implement their individual styles and decide how to handle personalized learning from their own definition. She indicated that this approach to date is also a disadvantage at the systems level by stating, *"I think there are those that have struggled with it, or are not suited for it [personalized learning], and I feel they are sort of treading water and no one is throwing them a lifesaver."*

When asked about the opportunity to receive professional development regarding personalized learning, the teacher indicated a perception of lacking collegial credibility on the subject matter.

"The people who were put in front of me to demonstrate it were colleagues that were

here in the building, and I'll be honest that they are colleagues I do not respect, and I

don't think they teach; so I kind of have a 'rrr' in the back of my throat over the whole

thing. So the colleagues who were put in front of me as the epitome of what I should be doing are not teachers in my estimation."

The teacher elaborated when asked about specific training opportunities provided by experts outside of the school district. She did not recall any particular training from anyone outside of the district, but rather encouragement from administrators to seek out and observe different styles of instruction among her colleagues. The teacher inferred that the administrators *"felt they were the ones implementing these strategies really well in their classrooms"* and she did not see any evidence-based strategies provided via professional development. As a conclusion to this theme, she did mention Chuck Schwahn, one of the authors of the book *Inevitable*, is *"supposed to come back to us"* and indicated a planned upcoming meeting with Bea McGarvey, the second author of the book *Inevitable*.

From the discussion on professional development, the teacher's comments indicate perceptions best described as GS1 #3 "Engage in professional development specific to my content area" and GS1 #4 "Participate in professional development aligned to my own professional goals and interests." This is best supported by her comments that teachers have been encouraged, by administration, to present to other faculty members. No external professional development was adequately described by the teacher to qualify further alignment in this guiding support area.

5.7.2 Pacing and pedagogy

The teacher used an interesting racehorse analogy to describe concerns about how to incentivize learning for all students, related to differentiated pacing. I have chosen to open this section with her quotation:

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"The winner crosses the line and goes to the winner's circle, and that's for all the reporters and where the crowd goes. Where is the crowd when that last horse comes across the line? Where is the cheer? The horse finished. Where are its accolades?"

She described an environment at CYHS where every learner is to proceed at his or her own pace, but the reality is meeting that expectation, because of teachers' concern about allowing students to become behind in their work. Specifically, she stated, *"I feel that we leave that tiny percent of those kids behind, and they are not getting the same accolades."* She expressed concern about kids finishing high school at this point in the conversation, ending with concerns for the last students to complete their learning targets, and stated, *"They didn't have to, but they finished; where are their accolades?"* Finally, she shifted the conversation to elaborate her concern for students who are not in the top 20% of academic achievement. She stated, *"That top 20 percent. . .will be successful regardless of anything that you do because it is driven; it is motivated. But what about the kid who isn't sure?"*

Flexible Scheduling (GS3) and Diagnosis of Learner Characteristics (GS4) have become the exclusive points of consideration under Pacing and Pedagogy, based on the interview data collected for the teacher. Each guiding support is described in a subsection inclusive of the teacher's commentary. A visual representation of the data collected in the Essential Starting Points for the teacher is displayed in Table 17.

Table 17. *Pacing and Pedagogy – Coding to the Teacher's Interview*

PACING AND PEDAGOGY		
Flexible Scheduling (Code: GS3)	Diagnosis of Relevant Learner Characteristics (Code: GS4)	Emphasis on Learning to Mastery (Code: GS5)
9. Follow flexible time schedules with students 10. Have control over time devoted to lessons and pacing as opposed to being bound to a strict bell schedule	14. Ensure that every learner has appropriately challenging material for his/her skill level that is not the same as every other student 15. Adjust tasks for students' varying interest levels	No data observed in interview.

5.7.2.1 Flexible scheduling (GS3)

The teacher stated that she loved block scheduling. She stated so emphatically, *"I would hate if they ever took block scheduling away from me; I would probably die."* They further described flexibility in the instructional day by referring to an additional block of time in which students may start and end their day earlier (e.g., Block 1 through Block 4) or start their day later and end their day later (e.g., Block 2 through Block 5). She stated that the same flexibility for instruction is offered to teachers as well, with floating starting and ending times for the workday. The purpose of the flexibility she described is two-fold: (a) availability of 'extra' courses to make possible early graduation from high school and (b) flexibility around work schedules for students that are employed at the same time they are going to school. She brought up one caution, however, when she stated, *"My hope is that they are going on to academic pursuits, not just going home and going to sleep,"* referring to students who may not fully engage in this flexibility of time.

She elaborated on her perspective of having an opportunity to engage with her students, above and beyond the flexibility in her work day:

"I am actually one of those teachers who chose the fifth block, because when you have students who choose to take that time, I would say 80 percent of them want to be there. If it weren't for the fifth block, I would not have had the opportunity to touch some of that 20 percent. So, it was really cool to be able to come in late and then stay a little later. I was out of here by 4:30. . .I am not a morning person, but we don't have to be here till 7:30, but you will find me at my desk at 6:15. Right now, I have kids in the room. It's my planning period, but there are six kids here. During my unassigned lunch time, you will find 10-15 kids. I am never without children at my feet."

From the discussion on flexible scheduling, the teacher's comments indicate perceptions best described as GS3 #9 "Follow flexible time schedules with students" and GS3 #10 "Have control over time devoted to lessons and pacing as opposed to being bound to a strict bell schedule." This is best supported by her description of having students present during differing and optional times of the day to provide instruction and learning activities. She did not elaborate, however, on the quality of effort that she experiences, but did describe several instances of flexible scheduling to place students into her classroom.

5.7.2.2 Diagnosis of relevant learner characteristics (GS4)

Emerging from the interview were commentary alignments related to diagnosing learners. The teacher often quantified learners in an 80/20 percent split, whereas as she described the most motivated and highest achieving learners in "the top 20 percent" and all remaining students as "the other 80 percent." She elaborated on her perceptions of how CYHS is handling two separate categories of students:

"I sort of feel that our district is increasing the achievement gap. We have a program here that I think caters to the top 20 percent of kids and excludes the other 80 percent, and I feel that the 80 percent from the bottom to the middle are the ones that we really need to focus on. The AP and honors-based will always find its way home so to speak, but the middle of the road kid or the kid that finds education to be the vinegar, I find that no one's talking about them."

While her concern was expressed for "the other 80 percent" of students, the teacher did indicate that she has observed changes. She stated her opinion that many teachers at CYHS have really reflected on the profession, have looked at what they are teaching, and decided 'how can I individualize this for particular kids?' She described hands-on projects that her colleagues have chosen to create for students to undertake in lieu of research papers in an effort to *"make learning more meaningful and more relevant for the kid."* She stated, more than once, that she was concerned about creating an achievement gap within CYHS and that teachers are doing their best to eliminate areas where that could happen. Specifically, she stated, *"Don't increase the achievement gap by creating that in your school, and then catering to it; cater to the kids who need you the most."*

From the discussion on diagnosis of relevant learner characteristics, the teacher's comments indicate perceptions best described as GS4 #14 "Ensure that every learner has appropriately challenging material for his/her skill level that is not the same as every other student," and GS4 #15 "Adjust tasks for students' varying interest levels." She described processes that her colleagues have designed to adapt learning activities to the needs of cohorts of students, but did not present individualized descriptions of this work.

5.7.3   Optimized targets

From the context of the teacher's interview, only one guiding support from the Optimized

Targets category emerged from the dialogue.   There were no alignments to Interdisciplinary

Instruction (GS6), but rather an exclusive discussion on Collegial School Culture (GS7).   The

subsection below will outline the teacher's perceptions and descriptions of this particular guiding

support.   A visual representation of the data collected in the Essential Starting Points for the

teacher is displayed in Table 18.

Table 18. *Optimized Targets – Coding to the Teacher's Interview*

OPTIMIZED TARGETS	
Interdisciplinary Approaches (Code: GS6)	Collegial School Culture Influencing Systemic Change (Code: GS7)
No data observed in interview.	26. Engage in collegial support to empower and enhance individual classroom practice
	29. Have a shared vision among teachers and administrators regarding professional goals for present and future

5.7.3.1 Collegial school culture influencing systemic change (GS7)

Related to GS7 #29, "Have a shared vision among teachers and administrators regarding

professional goals for present and future," the teacher described a concern about the professional

goals of CYHS, as stated in this scenario:

> *"I had a child yesterday who was concerned about a local placement test at the local*
>
> *community college. She has not taken math in almost a year, and I said, 'Well, what*

have you been doing to study?' She said, 'Well, I only have one class, [teacher]. I go

home, and I sleep!' So what are you doing to that child? She's not going to college. She

is going home. She is sleeping. She is not raising herself to the next level. Now, she is

probably going to have to take a remedial college course, which you know costs as much

as a regular college course. We have put her behind. We may have even pigeonholed

her by not holding her to a certain standard. Whereas on the assembly line, there is a

certain quality, or it doesn't get passed."

To summarize, the teacher described a disconnection between the message received by the students and the professional goals of CYHS. She elaborated on a need to create a shared vision, as many of her colleagues are not buying into the current learning model that has been presented. When asked how she perceives how the administrators have supported her, she responded, "gotten out of the way; stayed out of the way; allowed teachers to do what they need to do in their classrooms." She went on to say that there is definite teacher authority in the classroom. This comment supports GS7 #26, whereby the school would "engage in collegial support to empower and enhance individual classroom practice." She encouraged the notion that some faculty members are engaged in superior practices in an effort to "give the district what they want," but are not getting the affirmation and merit that has been earned. In our next interview, we will hear an administrator's perspective.

5.8   INTERVIEW #2: PRINCIPAL

The principal is currently employed by Central York High School (CYHS). On the survey, he indicated that he has 16-20 years of total public-school experience and further indicated that he has been working at CYHS for the past 6-10 years. He has earned a doctoral degree.

5.8.1   Essential starting points

The focus with the principal includes extensive reflections on professional development and opportunities for students to have access to technology via a learning management system. A visual representation of the data collected in the Essential Starting Points for the principal is displayed in Table 19.

Table 19. *Essential Starting Points – Coding to the Principal's Interview*

ESSENTIAL STARTING POINTS	
Professional Development for Teachers (Code: GS1)	Readily Available Technology for ALL Students (Code: GS2)
1. Engage in intra-district professional development to support personalized learning	8. Use technology to individualize instruction
4. Participate in professional development aligned to my own professional goals and interests	

5.8.1.1 Professional development for teachers (GS1)

The principal's discussion of professional development was solely focused on what CYHS has provided, rather than other sources of training. He spoke to "developing capacity" and providing

internal meetings that scaffold learning for teachers possessing different levels of knowledge with personalized learning practices. As he stated, *"the idea is that they [teachers] can go back after the day, talk to their colleagues, and then they can implement into their classrooms. Developing capacity, again, is our biggest hurdle and challenge moving forward."* He characterizes such meeting opportunities as professional learning spaces full of contestation and inquiry, rather than formalized professional development activities.

When probed about how external influences impact professional development at CYHS, he stated the following:

> *"We have gone to different conferences where Mass Customized Learning is the focus. Those, for us, have been more affirmation that we are already doing most of the things that other school districts are; so, there have been other workshops, other conferences to go to that are focused on Mass Customized Learning, so yes. There is professional development around that, but not as robust as some other things that are out there."*

He continued to describe opportunities for professional learning as *"assigned"* as mandatory engagement, but specified that all of his colleagues have a choice in what they want to study, or how they might serve via committee, while working in the district. The principal explained that opportunities for colleagues to assemble and discuss personalized learning occur approximately once per month, but a core group of building representatives then go to the district level to engage in a "holistic conversation, K-12."

From the discussion on diagnosis of professional development, the principal's comments indicate perceptions best described as GS1 #1 "Engage in intra-district professional development to support personalized learning" and GS1 #4 "Participate in professional development aligned to my own professional goals and interests." The activities that he described construct an

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opportunity for collaboration and communication to occur among colleagues, even though the description appears to be more collegial-learning minded than formalized and planned professional development.

5.8.1.2 Readily available technology for all students (GS2)

The principal elaborated on the online offerings that CYHS students access upon request. He described scheduling opportunities for students to elect self-directed learning in a web-based platform entitled Odysseyware®. The manufacturer of this learning management system describes the platform as a *"fully online, customizable curriculum library of over 300 courses"* (Odysseyware, 2018). In addition, teachers have the ability to use another platform to create and develop their own online course, via use of Schoology©. This learning management system is described by the manufacturer as *"aligned with the needs and learning style of education in the real world"* (Schoology, 2018).

The principal highlighted the presence of these two platform options as choice for both faculty and students. He stated that teachers, at times, have opposed Odysseyware because of his restatement of their feeling that *"[Odysseyware] is not our curriculum; we have not blessed off on it."* He quickly followed up to state that CYHS provides Schoology as a method for teachers to then take their own curriculum and develop their own online courses so that, *"We know that the content is CYHS-approved. . .essentially what the kids are getting in their regular courses, they are getting in the online courses."* It is apparent that forethought has driven the process for faculty and students to have wide access to learning opportunities via a learning management system.

5.8.2 Pacing and pedagogy

The focus with the principa, includes perspectives related to flexible scheduling, diagnosis of relevant learner characteristics, and emphasis on learning to mastery. A visual representation of the data collected in the Essential Starting Points for the principal is displayed in Table 20.

Table 20. *Pacing and Pedagogy – Coding to the Principal's Interview*

PACING AND PEDAGOGY		
Flexible Scheduling (Code: GS3)	Diagnosis of Relevant Learner Characteristics (Code: GS4)	Emphasis on Learning to Mastery (Code: GS5)
11. Follow flexible time schedules with students 12. Have control over time devoted to lessons and pacing as opposed to being bound to a strict bell schedule	16. Ensure that every learner has appropriately challenging material for his/her skill level that is not the same as every other student 17. Adjust tasks for students' varying interest levels	21. Alternative means for students to demonstrate mastery (e.g., use of projects, presentations)

5.8.2.1 Flexible scheduling (GS3)

The principal identified that approximately 60%-80% of CYHS course scheduling follows a traditional model, in alignment to a prescribed number of days of instruction and minutes per day. He estimated that the remaining 20%-40% of courses are delivered in some form of modification: 1) online learning, 2) a personalized self-pacing of a traditional course curriculum, and a final approach that is best defined as 3) episodic instruction. As discussed in the previous section, online learning is provided by the platforms Odysseywhere and Schoology, with the latter giving teachers the advantage to take their traditional curriculum and offer the same

learning in an online context. It also affords students an opportunity to self-pace their own

learning in an online context as the principal elaborated through several points in the interview.

5.8.2.2 Diagnosis of relevant learner characteristics (GS4)

What may be the most interesting of the scheduling approaches at CYHS is the concept of

episodic instruction, described as the principal illustrated, *"For the next week, you can just dive*

in deeply into that piece of curriculum you are really interested in." The principal described

'episodic instruction' as an opportunity for students to be self-paced through a course unimpeded

by the bell schedule. He further described an example of an episodic scenario in total:

> *"Let's say these are the ten units in your course: How will you allow more 'voice and*
>
> *choice' time in your curriculum to allow kids to get into a piece of maybe the content that*
>
> *they're really interested in? How can we move kids forward in classes that they are*
>
> *ready to go on? For example, I have an art teacher with about 4 weeks to go at the end*
>
> *of the school year. They are finished with the content. My job as an administrator is to*
>
> *help those kids and that teacher start the next course with four weeks remaining to go.*
>
> *That's hard to do because we've never done that before, but I'm working collaboratively*
>
> *with that teacher to try to put a plan in place to allow those kids (to experience) what we*
>
> *identify as an ideal self-paced type of environment. Okay, it didn't take me eighteen*
>
> *weeks to finish the course. It took me fourteen, and I'm ready to go."*

The principal elaborated extensively on the concept of *"voice and choice."* It took me a

while to understand what he meant by this ideal, as he said it five separate times in the interview.

When probing, it appeared that *"voice"* is defined as 'what' content students desire to study

along with *"choice"* being 'how much' or 'how long' they wish to study the content, made

available to them by either face-to-face or online offerings. The notion of *"voice and choice"*

seemed to mesh with the concepts aligned to flexible scheduling and diagnosis of learner characteristics. The principal interview supports GS4 #14, "Ensure that every learner has appropriately challenging material for his/her skill level that is not the same as every other student."

5.8.2.3 Emphasis on learning to mastery (GS5)

The principal discussed encouraging CYHS faculty to choose options with varied assessments of content mastery. He adamantly stated, *"There's got to be other ways that kids can show mastery of content rather than just by a test, a paper pencil test."* He encourages faculty members to allow students to choose an assessment mode in which they can more thoroughly express and define their own learning. Giving the example of concluding or assessing one unit of study, it is typical to administer an end-of-unit or chapter test. He encourages teachers to avoid a one-size-fits-all assessment strategy by asking, *"Can a child have the option of doing a project, doing a presentation, doing something online?"* He stated that this practice of offering alternative assessment options is increasing in frequency across faculty members at CYHS.

5.8.3   Optimized targets

The principal stated several viewpoints related to interdisciplinary approaches and a collegial school culture influencing systemic change. A visual representation of the data collected in the Essential Starting Points for the principal is displayed in Table 21.

Table 21. *Optimized Targets – Coding to the Principal's Interview*

OPTIMIZED TARGETS	
Interdisciplinary Approaches (Code: GS6)	Collegial School Culture Influencing Systemic Change (Code: GS7)
24. Teach concepts through projects that span multiple academic disciplines	26. Engage in collegial support to empower and enhance individual classroom practice
25. Have scheduled time or available time during the school day for collaboration, decision-making, scheduling, grouping, and cross-integration of academic content	29. Have a shared vision among teachers and administrators regarding professional goals for present and future

5.8.3.1 Interdisciplinary Instruction (GS6)

The principal described that CYHS has 21 classes that are offered as project-based, spanning more than one academic content area. He stated that over three school years this has grown from 12 classes to the current 21 classes. The principal also discussed the Apollo Program at CYHS. This program is an interdisciplinary elective for students in which 3 instructional blocks in their day are designated exclusively for project-based learning in English, social studies, and art. Three teachers are assigned as *"learning facilitators"* for this course, whereas students quickly identify a concept that they would like to study, and the teachers subsequently guide students along a pathway of learning related to their three respective areas: English, social studies, and art. Finally, he mentioned that this program has become popular in recent years, with total enrollment growing from 60 students to 100 students in one year.

5.8.3.2 Collegial school culture influencing systemic change (GS7)

The principal referred to creating a culture of a growth mindset, a goal likely attributed to the book *Mindset: The New Psychology of Success* (Dweck, 2008). He referred to CYHS faculty often asking him to summarize basic points of their personalized learning initiatives; he referred to his summary as a *"stump speech"* which defines as *"[instructional] rate, [learning] style, and technology [access]."* The principal described a culture at CYHS that was dictated to him from the Superintendent.

> *"[He] gave me the book Inevitable to read and kind of said, 'This is the vision; help us get there.' That's kind of the training that I got, and it is a matter of like-minded individuals having conversations about how we get there. And so that's the challenge I had as an administrator, when I first, five or six years ago, sat in that room with those twelve teachers who said, 'Where can we go to see this?'"*

The principal insisted that personalized learning requires *"building capacity"* in colleagues. He stated that there are no college programs explicitly teaching personalized learning strategies, so CYHS administrators are required to engage new employees into the building's vision. He also spoke to the concept of *"buy-in"* for educators to acknowledge that students *"learn at different rates. . .have different learning styles."* He encourages fellow colleagues to recognize that *"technology has changed the game [of education],"* for there are many different options for learning experiences beyond the confines of the traditional classroom. Finally, he stated, *"relationships will always reign supreme,"* referring to positive relationships that should be fostered inside of the organizational culture to ensure that opportunities for learning are maximized.

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The principal also spoke to developing a "shared vision" whereas faculty members are required to develop a differentiated supervision plan in support of the CYHS vision, which he did not present. However, he did refer to two documents (Learner Agency Continuum and Learner Experience) that are discussed later in this chapter. Specific to empowering and enhancing individual classroom practice, the principal stated, "We have tried to develop a culture of 'fail forward'" and continually assure faculty members that failure is not observed as a bad thing as long as they have the commitment to "try something new."

5.9   ANALYSIS OF DOCUMENTATION ARTIFACTS

Qualification of activities and attributes captured via survey and interviews at CYHS required an examination of documentation supportive of personalized learning strategies at the school. The principal provided three documentation artifacts that are presented here as further reference to activities at CYHS. The artifacts were collected to help exemplify and describe personalized learning practices and serve as a discussion opportunity to align and map attributes of these documents to the guiding supports identified in the Conceptual Framework of Personalized Learning.

5.9.1   The Apollo Program brochure

The Apollo Program at CYHS is designed to provide "a customizable fusion of Art, English, and Social Studies," quoted by the three instructors listed on the artifact (Grandi, Ward, Wimmer, 2018). Students from grades 9 through 12 are eligible to select this program as an elective,

whereas 3 of the 4 blocks of the school day are designated to it. The program is advertised in four descriptive categories: time, space, pace, and place. Figure 9 is a reduced-size copy of the documentation artifact.

Figure 9. Apollo Program Brochure

From the descriptors of each category, the guiding supports serve as attributed alignments to the conceptual framework. They are grouped sequentially from left to right, exhibiting the relevant guiding support categories in each column. Within each column, the literature-derived descriptors of the guiding support are listed at the top with mapped evidence from the document in a bulleted list at the bottom. Data are collated in Table 22.

Table 22. *Apollo Program Brochure - Mapping to Guiding Supports*

ESSENTIAL STARTING POINTS	PACING AND PEDAGOGY			OPTIMIZED TARGETS
Readily Available Technology for ALL Students (Code: GS2)	Flexible Scheduling (Code: GS3)	Diagnosis of Relevant Learner Characteristics (Code: GS4)	Emphasis on Learning to Mastery (Code: GS5)	Interdisciplinary Approaches (Code: GS6)
#1 Have personal mobile devices (or 1:1 device programs)	#10 Have control over time devoted to lessons and pacing as opposed to being bound to a strict bell schedule	#14 Ensure that every learner has appropriately challenging material for his/her skill level that is not the same as every other student #15 Adjust tasks for students' varying interest levels	#16 Customize instruction to the needs of the learner #17 Differentiate delivery of instruction for various learning styles #18 Use differentiated pacing for groups of students within a classroom #21 Alternative means for students to demonstrate mastery (e.g., use of projects, presentations)	#24 Teach concepts through projects that span multiple academic disciplines
		Mapped Evidence		
1:World – referring to individual students having mobile devices provided by school district	Self-scheduled day Self-selected workspace One on one appointments (with faculty)	Readiness through accommodation Passion based (referring to material)	Project based Mini lessons offered/requested Mastery Learning	Fusion of Art, English and Social Studies Community Outreach

According to the principal, the Apollo Program is a prominent example of how teachers collaborated and came to a conclusive product in the form of an innovative learning experience. Interviews with both the principal and the teacher indicated that this program is of increasingly popularity in the student body at CYHS, ostensibly due to the flexibility of time and learner-centered attributes of the coursework.

5.9.2   Central York School District (CYSD) Ideal Learning Experience Classroom Placard

The Central York School District (CYSD) Ideal Learning Experience Classroom Placard was designed to explicitly display expectations of all students and educators across the district. According to the principal, this placard was designed by district administration, to express operational expectations in each classroom. This placard is professionally printed and displayed prominently in each classroom within all of the district's eight school buildings. On the document, note that the word 'learner' is used to refer to a 'student.' The expectations of a CYSD learner are defined in terms of how the organization mandates itself to provide an "ideal learning experience" for each learner. Figure 10 displays a reduced-size copy of the documentation artifact.

Central York School District
THE IDEAL LEARNING EXPERIENCE

Each Central York School District Learner…

✓ *Is met at his/her level of learning*

✓ *Is using one of his/her best learning styles*

✓ *Is learning skills and concepts with content of high interest to him/her*

✓ *Understands the relevancy of what he/she is learning*

✓ *Is challenged and successful*

✓ *And, looks forward to coming back tomorrow*

Figure 10. CYSD Ideal Learning Experience Placard

As in Figure 10, the guiding supports serve as evidence, which is mapped to the conceptual framework.   There are no apparent mappings to Essential Starting Points or Optimized Targets; all mapping is relevant only to the Pacing and Pedagogy category, specifically in the area of Diagnosis of Relevant Learner Characteristics as outlined in the literature review. Data are collated in Table 23.

Table 23. *CYSD Ideal Learning Experience Placard - Mapping to Guiding Supports*

PACING AND PEDAGOGY

Diagnosis of Relevant Learner Characteristics (Code: GS4)

#11 Plan and design for instructional activities that are commensurate with the student's readiness

#12 Use developmentally appropriate presentations for small groups

#13 Ensure intellectual readiness of the learner

#14 Ensure that every learner has appropriately challenging material for his/her skill level that is not the same as every other student

#15 Adjust tasks for students' varying interest levels

Mapped Evidence

Is met at his/her level of learning

Is using one of his/her best learning styles

Is learning skills and concepts with content of high interest to him/her

Is challenged and successful

No Applicable Evidence

"Understands the relevancy of what he/she is learning"

"And, look forward to coming back tomorrow"

5.9.3 Learner agency continuum document

Mr. Ryan Caufman, current Principal of Central York High School designed a "learner agency continuum" document for the school. Mr. Caufman is currently on Active Military Leave and deployed out of the country, therefore not providing an opportunity for an interview. The acting

High School Principal provided the document for analysis. The document is presented in Figure

11.

Learner Agency Continuum

Type of Agency	Curriculum	Instruction	Assessment
Ideal	Learner selects area of study that connects to their individual learning/ career goals. The learning facilitator mentors the learner to choose rigorous skills, resources, and content to explore.	The learning facilitator mentors the learner through their mastery of the skills selected, the discovery of the content, and provides guidance on their authentic assessments.	The learner selects an authentic project that will allow them to demonstrate mastery of the skills selected. The learning facilitator evaluates feedback from the learner's selected audience (local and global), evaluates the level of mastery, provides additional feedback, and allows for the learner to resubmit in order to demonstrate the highest levels of mastery.
Rich	Learning facilitator provides the themes that will establish direction for the learners. The learner chooses rigorous resources and content that is relevant to their interests and learning/ career goals under those assigned themes.	The learning facilitator provides mini-lessons around the leanring outcomes/ skills to facilitate understanding. The learning facilitator then mentors the learner's self-directed learning experience. The learning facilitator coaches the learner through their discovery of the selected content ensuring all selected skills are addressed.	Learners choose how to demonstrate mastery of the learning outcomes/skills through agreed upon authentic assessments. Learners have the opportunity to resubmit in order to demonstrate the highest levels of mastery. The learning facilitator evaluates the level of mastery, provides feedback, and supports the creation of a local audience in order to receive additional feedback.
Established	Learning facilitator provides the learning outcomes/skills required for a particular unit/ theme. The learning facilitator and learner chooses rigorous resources and content that is relevant to the learner's interests and learning/ career goals under that assigned unit/ theme.	The learning facilitator provides mini-lessons around the leanring outcomes/ skills to facilitate understanding. Small group and individual instruction continues while others proceed with their learning.	Learners are provided examples of assessments that meet the learning facilitators requirements but are provided the opporunity to design their own authentic assessment that still meets the requirements.
Evolving	The learning facilitator establishes the curriculum but allows learners opportunities for discovery within the set parameters.	Learning facilitator plans for equal time for both direct instruction and time for learners to explore within the preselected learning outcome or skill/ theme.	Assessments are designed to allow for learner choice within the specified framework of the rubric.
Regulated	The learning facilitator establishes the curriculum. The learner has no choice in the learning outcomes, skills/ themes or content to be covered.	Learning facilitator plans for regular daily instruction but allows some time for discovery within the prescribed learning outcome or skill/ theme. The learner can explore within the prescribed curriculum at designated times.	Assessments are well defined with a rubric and allows learners to select from a predetermined list of projects or have nominal choice through project rubrics. ©Ryan Caufman

Figure 11. Learner Agency Continuum, attributed to Mr. Ryan Caufman, High School Principal

From the descriptors of each category, the guiding supports serve as attributed alignments to the conceptual framework. They are grouped sequentially from left to right, exhibiting the relevant guiding support categories in each column. Within each column, the literature-derived descriptors of the guiding support are listed at the top with mapped evidence from the document in a bulleted list at the bottom. Data are collated in Table 24.

Table 24. *Learner Agency Continuum - Mapping to Guiding Supports*

PACING AND PEDAGOGY		
Flexible Scheduling (Code: GS3)	Diagnosis of Relevant Learner Characteristics (Code: GS4)	Emphasis on Learning to Mastery (Code: GS5)
#10 Have control over time devoted to lessons and pacing as opposed to being bound to a strict bell schedule	#14 Ensure that every learner has appropriately challenging material for his/her skill level that is not the same as every other student #15 Adjust tasks for students' varying interest levels	#16 Customize instruction to the needs of the learner #17 Differentiate delivery of instruction for various learning styles #18 Use differentiated pacing for groups of students within a classroom #19 Use learning contracts to provide for self-pacing and targeted independent practice #21 Alternative means for students to demonstrate mastery (e.g., use of projects, presentations) #22 Use of multiple assessments to ensure mastery
Mapped Evidence		
Instruction/Regulated: "The learner can explore within the prescribed curriculum at designated times. (#10)	Curriculum/Rich: "The learner chooses rigorous resources and content that is relevant to their interests and learning/career goals under those assigned themes." (#15) Curriculum/Established: "The learning facilitator and learner chooses rigorous resources and content that is relevant to the learner's interests and learning career/goals under that assigned unit/theme." (#14)	Instruction/Established: "Small group and individual instruction continues while others proceed with their learning." (#16, #17, #18) Assessment/Rich: "Learners choose how to demonstrate mastery of the learning outcomes/skills through agree upon authentic assessments." (#19) Assessment/Ideal: "The learning facilitator evaluates feedback from the learner's selected audience…evaluates the level of mastery, provides additional feedback, and allows for the learner to resubmit in order to demonstrate the highest levels of mastery." (#22)

5.10   LOOKING AHEAD

In Chapter 5, I mapped survey data, interview data, and documentation artifacts to illuminate personalized learning practices at Central York High School. In Chapter 6, I will analyze several document artifacts provided by the high school, in relation to the seven guiding supports framed in this study.

6.0   ANSWERS TO THE RESEARCH QUESTIONS

This chapter is divided into several sections that include the discussion of seven guiding supports derived from a base of literature that allowed the researcher to study the role of supports within a school professing to offer personalized learning. During the data presentation phase in Chapters 4 and 5, the narratives written to describe three data sources are provided in preparation for analysis in this chapter. The shared experiences of 35 participants in the <u>survey</u> delineate perceptions around the guiding supports of personalized learning derived from the literature (see Chapter 2). The deep and thoughtful experiences of two separate participants, captured from <u>interviews</u> with both a teacher and an administrator, eloquently glean perceptions of personalized learning in the high school. Finally, a <u>review of documentation</u> reveals priorities and focal points of Central York High School's journey into personalized learning and highlights priorities within their efforts. This discussion of the guiding supports addresses two research questions explored in this study:

1. How is personalized learning described in a school professing to implement

    personalized learning?

2. How does the concept of personalized learning in a school map onto seven guiding

    supports of personalized learning strategies drawn from the literature?

The seven guiding supports that will be discussed throughout this chapter are (a) Professional Development for Teachers, (b) Readily Available Technology for ALL Students, (c)

Flexible Scheduling, (d) Diagnosis of Relevant Learner Characteristics, (e) Emphasis on Learning to Mastery, (f) Interdisciplinary Approaches, and (g) Collegial School Culture Influencing Systemic Change.

6.1   PROFESSIONAL DEVELOPMENT FOR TEACHERS (GUIDING SUPPORT 1)

6.1.1   Description of professional development at Central York High School

Central York High School educators described professional development practices that are internally generated. During interviews, both the teacher and the principal indicated that training for professional development from outside sources is virtually absent, but training is organized and presented to the faculty by other Central York teachers. The stated frame of reference for teachers to learn about personalized learning practices is almost completely internal; although, both interviews revealed evidence of consultations with Bea McGarvey and Chuck Schwan, the authors of *Inevitable* (2013), and also opportunities to visit other schools. None of the data indicated formally designed training brought to the district, but rather only organized opportunities for classroom observation and trading of ideas around colleague practices, which could be aligned to the conceptual framework for this study in a limited number of instances.

There appeared to be a disconnect between the principal's assertion of "voice and choice," which he defined as affording students a choice in content and pace, versus the teacher's perception of that expectation. She described how inconsistently professional development is scheduled and organized among individual teachers. A large percentage of the respondents indicated opportunities for professional development once a month, but no shared collaboration

time (n=7, 25.0%).   In the same sampling, satisfaction regarding adequacy of shared collaboration time was also mixed, with the average choice of all respondents (n=35) is 55.8% on a 0 to 100 range.   Specific to the literature, Penuel et al. (2007) advocated that strong interaction with curriculum structure required professional development providers to meet the training needs of the teachers.   This data does not indicate teacher satisfaction with either the adequacy of collaboration time or the notion that expertise is found from within.   It further indicates that while the district engages teachers with implementation of personalized learning strategies, it limits external learning opportunities with professional learning providers.   The data also reveals that high school is inconsistent with the teaching time devoted to collaboration.

Cwikla (2003) suggested the ideal that innovation in practice could not be enabled until teacher learning goals were explicitly identified.   The study found no evidence of teacher learning goals, provided by the individual teachers, the high school principal, or the school district administration.   While there was demonstrable evidence of some collaboration time, the goals of the professional learning to be provided during those opportunities were not discovered.

The study further revealed that there was a disconnect in ranking priority of professional development among teachers and administrators.   This is discussed in further detail at the end of this chapter.

6.1.2   Mapping of professional development at Central York High School to conceptual framework

Two of three data sources reveal evidence that map to the study's Conceptual Framework of Personalized Learning.   While there was no documentation of professional development observed, both the survey and the interviews revealed data that is organized in Table 25.

Table 25. *Concept Mappings to Professional Development for Teachers (GS1)*

Guiding Support 1 (GS1): Professional Development for Teachers	Data Sources/Evidence		
Concepts	Survey	Interview	Documentation
GS1-#1 Engage in intra-district professional development to support personalized learning	Once per month (65.4% of all respondents) with several respondents *never implementing this practice* (26.9%)	Teacher - Not observed Principal - Observed: opportunity to engage in a "holistic" conversation, K-12	Not observed
GS1-#2 Engage in professional development for new teaching strategies and new curriculum content before expectation for classroom implementation	Once per month (61.5% of all respondents) with several respondents *never implementing this practice* (26.9%)	Teacher – Not observed Principal – Not observed	Not observed
GS1-#3 Engage in professional development specific to my content area	Once per month (42.3% of all respondents) with several respondents *never implementing this practice* (30.8%)	Teacher – Observed: invited to present professional development to other faculty members Principal – Not observed	Not observed
GS1-#4 Participate in professional development aligned to my own professional goals and interests	Once per month (50.0% of all respondents) with several respondents *implementing practice once per week* (23.1%)	Teacher - Observed: encouraged to receive professional development from other faculty members via observation Principal – Observed: discussion and inquiry among intra-district colleagues	Not observed

The table denotes the relevant evidence found within each data source, which is mapped to literature. Data reveals that 1) professional development occurs mostly once per month, 2) professional development opportunities generally occur once per month, and 3) professional development occurs as teacher collaboration, consisting of conversation and discussion from presentations and peer observations.

6.2   READILY AVAILABLE TECHNOLOGY FOR ALL STUDENTS (GUIDING SUPPORT 2)

6.2.1   Description of technology at Central York High School

All three data sources revealed that Central York High School has extensive technology access for their students. Not only are students provided with a mobile electronic device to gain access to online resources, they are given two online learning platforms in which to engage in learning opportunities. Both learning platforms are aligned to standards-aligned content areas, one of which is exclusively designed and delivered by an online learning provider (Odysseyware) with the other platform affording an opportunity for Central York High School teachers to transform their current courses into an online experience (Schoology).

Each student has his or her own device, which is available for use inside and outside of the school building; this includes usage twenty-four hours a day, seven days per week. Despite ubiquitous evidence that students have access to electronic devices, when asked if technology usage was adequate, the query yielded an average choice of all respondents (n=35) of 66.7% on a 0 to 100 range. The discrepancy may be caused by perceptions of "availability" versus

"adequacy," the latter of which is a perception. The high school has proven that technology is provided to every student; perhaps some students are not using it to full potential, or as 'adequately' perceived by their teacher and principals.

Interestingly, only the administrator interviewed (not the teacher) addressed online learning, in an effort to illustrate that the technology provides an opportunity for learning beyond the school day for the sake of flexibility. Quality of online instruction was not identified in this study. Access to academic content was described as a utility, further promoting the availability of a learning experience whenever the student elects to engage.

For the teacher, there was considerable commentary about the "top 20 percent of students," related to their academic achievement. Her assertion was that the school district is placing much focus on academically motivated students and not doing enough for "the bottom 80 percent." Arguably, this data could be similar to Bebell's (2005) research finding that, when provided a one-to-one environment of technology, some students display increased effort in the quality of products produced. For the teacher, the remaining 80 percent of students may be perceived as not "adequately" using the technology, as previously described in this section.

6.2.2 Mapping of technology at Central York High School to conceptual framework

All three data sources reveal evidence that map to the study's Conceptual Framework of Personalized Learning as organized in Table 26.

Table 26. *Concept Mappings to Readily Available Technology for ALL Students (GS2)*

Guiding Support 2 (GS2): Readily Available Technology for ALL Students	Data Sources/Evidence		
Concepts	Survey	Interview	Documentation
GS2-#5 Have personal mobile devices (or 1:1 device programs)	Yes. (100% of all respondents indicating access to personal mobile devices)	Teacher – Not observed Principal – Not observed	
GS2-#6 Have technology available for students in classrooms	Yes. (100% of all respondents indicating access to personal mobile devices)	Teacher – Not observed Principal – Not observed	Apollo Program Brochure: "1:World", all of which refer to individual students having mobile devices provided by school district.
GS2-#7 Provide devices for students to take home on a regular basis	Yes. (100% of all respondents indicating access to personal mobile devices)	Teacher – Not observed Principal – Not observed	
GS2-#8 Use technology to individualize instruction	Above Average (an average response of 66.7% on a 0 to 100 range)	Teacher - Not observed. Principal – Observed: reference to learning management systems (e.g. Odysseyware, Schoology)	

The table denotes the relevant evidence found within each mapping to literature. Data reveal that (a) students have take-home access to mobile devices 24 hours a day, 97 days per week; (b) students have access to an online learning management system (LMS); (c) teachers have access to transform their courses into an online version via a LMS; and (d) a supermajority of survey respondents feel that technology is being used to individualize instruction for students.

The concept mappings do not align to the participants' lower perception regarding technology adequacy. This is a surprising finding for which I am unable to discover a rationale. The high school may choose to investigate the reasons for this unusual finding of dissatisfaction as a means to remedy this perception.

6.3   FLEXIBLE SCHEDULING (GUIDING SUPPORT 3)

6.3.1   Description of flexible scheduling at Central York High School

Central York High School designed its operational day with several supports of flexibility. Students can schedule their days across five blocks of instruction, each consisting of 75 minutes, as outlined in Table 27.

Table 27. *Central York Bell Schedule, 2017-2018 School Year*

Period 1	Announcements	Period 2	Period 3	Period 4	Flex-Time	Period 5
7:45-9:00	9:04-9:19	9:23-10:38	*10:42-12:38	12:42-1:57	2:01-2:46	2:50-4:05

*41 min for lunch included

It is important to highlight that one of the most novel features of this schedule is the flexibility for students and staff alike to start early/end early (blocks 1-4) or start late/end late (block 2-5). There is also an additional provision for students to receive additional learning opportunities, access to teacher support, and clubs during the "flex-time" denoted on the schedule.

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While the structure of the schedule appears to be flexible, it is still a "bell schedule" where instruction starts and stops at the ding of a bell. Survey participants were asked to ascertain their perceptions of scheduling flexibility, reported as adequacy and satisfaction. Participants (n=35) indicated average satisfaction of 52.7% on a 0 to 100 range with their own control over time devoting to teaching and pacing, as opposed to the boundaries of a bell schedule. In similar fashion, participants (n=35) indicated average satisfaction of 48.1% on a 0 to 100 range related to adequacy of flexibility with student scheduling.

During the interviews, the teacher and the principal both indicated examples of how the schedule strategically facilitated their work. The teacher referred to multiple opportunities for students to access her when needing help or additional instruction while the principal referred to the flexibility of learning via online courses at any time and even while at home. The separate strategies reported in these interviews may be divergent from the school's intention of flexible scheduling for students; the teacher indicated an exclusive school day opportunity for access, which is different to the online access and course availability that is advertised by the high school. The survey data related to perceptions of flexible scheduling is mixed and is inconclusive.

The principal referred to "episodic instruction" where CYHS extends an opportunity for students to be self-paced through a course unimpeded by the bell schedule. This approach to self-paced learning is fairly new at the school and is not offered building-wide to all students. Rickabaugh (2016) spoke to flexible time structures when he inferred that educators could choose to support student learning under a wide range of circumstances.

Two of the three artifacts in the document analysis revealed school personnel having control of time devoted to instruction and pacing, as opposed to adherence to the bell schedule.

The Apollo Program brochure indicated a self-scheduled school day with one-on-one appointments with the three teachers that teach in that program. The Learner Agency Continuum, attributed to Ryan Caufman, Principal of CYHS, indicated that a student could explore within the prescribed curriculum at designated times. While there are sincere approaches to creating flexible time structures in the school, the average survey response data, when juxtaposed with the interviews and documentations, indicates that flexibility of time for learning remains a work in progress for the administrators and teachers in the school.

6.3.2 Mapping of flexible scheduling at Central York High School to conceptual framework

Three of three data sources reveal evidence that map to the study's Conceptual Framework of Personalized Learning. Survey, interviews, and documentation revealed data that is organized in Table 28.

Table 28. *Concept Mappings to Flexible Scheduling (GS3)*

Guiding Support 3 (GS3): Flexible Scheduling	Data Sources/Evidence		
Concepts	Survey	Interview	Documentation
GS3-#9 Follow flexible time schedules with students	Average (an average response of 48.1% on a 0 to 100 range)	Teacher - Observed: referenced to early starts or staying late, as provided in the teacher workday Principal – Observed: reference to "episodic" instruction	Apollo Program Brochure: Self-scheduled day
GS3-#10 Have control over time devoted to lessons and pacing as opposed to being bound to a strict bell schedule	Average (an average response of 52.7% on a 0 to 100 range)	Teacher - Observed: extra block of time (e.g. "block 5") where students and teachers can meet Principal – Observed: availability of online courses to be taken anytime	Apollo Program Brochure: One-on-one appointments (with faculty) Learner Agency Continuum: Instruction/Regulated: "The learner can explore within the prescribed curriculum at designated times."

Data sources reveal that while flexible scheduling is moderately accepted by the survey

participants, there are multiple and varied approaches to the actual scheduling and delivery of

instructional opportunities. To qualify this, the school has shown evidence of (a) flexibility of time, (b) online course access, (c) one-on-one appointments with teachers, (d) "episodic instruction" used within a course with the intent of deeper learning, and (e) flexible work schedules for teachers. There are differing perspectives, as stated in the previous description of Flexible Scheduling, revealing unclear messages regarding the school's flexibility in scheduling. All three data sources indicate that flexible scheduling is possible; the degree of satisfaction among teachers and principals is varied.

6.4   DIAGNOSIS OF RELEVANT LEARNER CHARACTERISTICS (GUIDING SUPPORT 4)

6.4.1   Description of diagnosis of relevant learner characteristics at Central York High School

It is apparent that Central York High School evidences multiple examples of attention to relevant learner characteristics across all three data sources. There is extensive activity reported at the school related to the diagnosis of learner characteristics. Vygotsky (1986) speaks to a varied level of readiness across a classroom of students, intimating the familiar Zone of Proximal Development (ZPD). It is important to highlight and analyze the data that lead to themes on this topic at CYHS.

The survey revealed that teachers frequently examine, a majority of respondents doing so on no less than a weekly basis, the learner's readiness and interest levels, perhaps similar to differentiated instruction. Tomlinson (1999) suggests that, when differentiating instruction,

teachers can challenge all learners by providing varied levels of difficulty, adapting the amount of scaffolding, and modifying the way in which students demonstrate effort. CYHS teachers appear to be using differentiated instruction as a goal to capitalize on the individual student's growth and abilities by delivering learning at the precise level of the student's understanding, further maximizing his or her learning experience.

During the interviews, the phrase *"voice and choice"* emanated from the principal multiple times. It was apparent that this was a cliché strategy to encapsulate the ideal of differentiated instruction, perhaps, as indicated through the interview, in a way to engage parents and students in accepting ownership for their learning. In contrast, the teacher expressed a concern about the *"voice and choice"* concept being used to *"cater"* to highest achieving students, which she referred to as the *"top 20%."* It is necessary to approach this scenario with caution, as the potential exists for students to receive an unclear message about how much ownership is actually afforded to them. When looking back to the survey data, teachers indicated that they engaged in diagnosis of learner characteristics at least once-per-week. This appeared as a disconnect to the teacher's assertion that only the highest achieving students are receiving *"voice and choice."*

The documentation further revealed several examples of how learner characteristics shape the documentation of the school. One predominant theme that perhaps appropriately describes the school environment is the emphasis of a student being "met at his/her present level of learning." The CYSD Ideal Learner Experience placard clearly articulates this ideal, and it seems to be a district message rather than one reserved for the high school. The Apollo Program, offered only at the high school, articulates the encouragement of "passion-based" learning as

well as promoting "readiness through accommodation." An insistence on diagnosis of learner readiness is quite evident across all documentation.

The principal elaborated on "episodic instruction," which he defined as deep engagement into a smaller, or perhaps more specific component of the curriculum in which student has expressed a high level of interest to study. The proposition of the school's course structure being ready and prepared to engage with individual interest serves as a novel characteristic of this high school, a theme of willingness to adapt to different styles of learners that has emerged from this guiding support section.

6.4.2   Mapping of diagnosis of relevant learner characteristics at Central York High School to conceptual framework

Three of three data sources reveal evidence that map to the study's Conceptual Framework of Personalized Learning. Survey, interviews, and documentation revealed data that is organized in Table 29.

Table 29. *Concept Mappings to Diagnosis of Relevant Learner Characteristics (GS4)*

Guiding Support 4 (GS4): Diagnosis of Relevant Learner Characteristics	Data Sources/Evidence		
Concepts	Survey	Interview	Documentation
GS4-#11 Plan and design for instructional activities that are commensurate with the student's readiness	Once per week (40.7%) to Once per day (40.7%) (81.4% of all responses)	Teacher – Not observed Principal – Not observed	CYSD Ideal Learning Experience Placard: Is met at his/her level of learning
GS4-#12 Use developmentally appropriate presentations for small groups	Once per week (33.3%) to Once per day (33.3%) (66.6% of all responses)	Teacher – Not observed Principal – Not observed	CYSD Ideal Learning Experience Placard: Is met at his/her level of learning
GS4-#13 Ensure intellectual readiness of the learner	Once per week (38.5%) to Once per day (34.6%) (73.1% of all responses)	Teacher – Not observed Principal – Not observed	CYSD Ideal Learning Experience Placard: Is met at his/her level of learning
GS4-#14 Ensure that every learner has appropriately challenging material for his/her skill level that is not the same as every other student	Once per week (38.5%)	Teacher - Observed: Concerned about leaving students behind due to focus on top 20% Principal - Observed: "Voice and choice"	Apollo Program Brochure: Readiness through accommodation CYSD Ideal Learning Experience Placard: Is using one of his/her best learning styles
GS4-#15 Adjust tasks for students' varying interest levels	Once per week (46.4%)	Teacher - Observed: Indication adaptation of content to suit student interests Principal - Observed: "Episodic instruction"	Apollo Program Brochure: Passion based CYSD Ideal Learning Experience Placard: Is learning skills and concepts with content of high interest to him/her

6.5   EMPHASIS ON LEARNING TO MASTERY (GUIDING SUPPORT 5)

6.5.1   Description of emphasis on learning to mastery at Central York High School

Data at Central York High School revealed several instances of how learning to mastery is emphasized in the school. Survey evidence provided a look into how classroom teachers seek to differentiate instruction in an effort to enable students to demonstrate learning to a mastery level of ability. Strategies such as adapting for different learning styles and customizing instruction to the needs of the learner were reported by the largest number of constituents, in the range of the behaviors occurring once per week to once per day. Parallel to this trend, the use of formative assessment was reported with similar frequency. Participants also reported the ability for students to have both alternate forms and multiple iterations of assessment at least once per week to demonstrate conceptual mastery.

The interviews and documentation showed little evidence to support the survey data relative to mastery learning. However, there is evidence that some classroom teachers are not only shifting their instruction, but also modifying their assessment practices in support of mastery learning. This is further supported by the principal's statement that he encourages teachers to mirror differentiated instruction with differentiated assessment practices. Both the documentation from The Apollo Program and CYSD Ideal Learner Experience increase confidence that teachers encourage students to learn to a mastery level, the frequency of which is varied among classroom teachers, based on their own survey reporting. Diagnosis of learner characteristics serves a prerequisite of mastery learning but does not guarantee its existence. Nevertheless, evidence reveals that this goal of learning to mastery at the school is addressed to some degree.

6.5.2 Mapping of learning to mastery at Central York High School to Literature

All three data sources reveal evidence that map to the study's Conceptual Framework of Personalized Learning. Survey, interviews, and documentation revealed data that is organized in Table 30.

Table 30. *Concept Mappings to Emphasis on Learning to Mastery (GS5)*

Guiding Support 5 (GS5): Emphasis on Learning to Mastery	Data Sources/Evidence		
Concepts	Survey	Interview	Documentation
GS5-#16 Customize instruction to the needs of the learner	Once per week (44.8%) to Once per day (44.8%) (89.2% of all respondents)	Teacher – Not observed Principal – Not observed	Apollo Program Brochure: Mini lessons offered/requested Learner Agency Continuum: Instruction/Established: "Small group and individual instruction continues while others proceed with their learning."
GS5-#17 Differentiated delivery of instruction for various learning styles	Once per week (44.8%) to Once per day (37.9%) (82.7% of all respondents)	Teacher – Not observed Principal – Not observed	Apollo Program Brochure: Mini lessons offered/requested
GS5-#18 Use differentiated pacing for groups of students within a classroom	Once per month (39.3%)	Teacher – Not observed Principal – Not observed	CYSD Ideal Learning Experience Placard: Is met at his/her level of learning
GS5-#19 Use learning contracts to provide for self-pacing and targeted independent practice	Inconclusive trend: some using Once per week (29.6%), Once per day (29.6%), to Never Implemented (29.6%)	Teacher – Not observed Principal – Not observed	Not observed
GS5-#20 Use formative assessment	Once per day (42.9%)	Teacher – Not observed Principal – Not observed	Not observed

Table 31 (continued)

GS5-#21 Alternative means for students to demonstrate mastery (e.g., use of projects, presentations)	Once per week (39.3%)	Teacher - Not observed Principal – Encouraging faculty to increase usage of alternative projects	Apollo Program Brochure: Mastery Learning
GS5-#22 Use of multiple assessments to ensure mastery	Once per week (46.4%)	Teacher – Not observed Principal – Not observed	Not observed

6.6   INTERDISCIPLINARY APPROACHES (GUIDING SUPPORT 6)

6.6.1   Description of interdisciplinary approaches at Central York High School

Evidence of interdisciplinary learning at CYHS were limited. The survey revealed that while some teachers participated with interdisciplinary learning, many have never experienced it. Both the principal's interview and the artifacts supported the presence of The Apollo Program, an interdisciplinary course option for students, fusing together art, English, and social studies. However, this course appeared to be the sole option for interdisciplinary learning in the school. Interdisciplinary instruction appears to exist in limited course offerings of the school. This is consistent with the sequential design of the Conceptual Framework of Personalized Learning, where interdisciplinary instruction is an "optimized target" expected to be achieved only after several other guiding supports are implemented and have come to fruition within the school.

The survey data also supports that some interdisciplinary instruction is occurring in the school, most likely in the form of singular lessons or units across academic areas. This was not probed in the interviews or via documentation and would be subject to future research.

Interdisciplinary instruction exists in part to inspire collaboration (Georgiades, 1969) and an innovative opportunity exists to enhance this practice at CYHS.

6.6.2 Mapping of interdisciplinary approaches at Central York High School to literature

Survey data predominantly maps to the study's Conceptual Framework of Personalized Learning. Interview and documentation data is less specific, with the latter two data sources showing data specific to the Apollo Program at CYHS. All revealed data are organized in Table 31.

Table 31. *Concept Mappings to Interdisciplinary Approaches (GS6)*

Guiding Support 6 (GS6): Interdisciplinary Approaches	Data Sources/Evidence		
Concepts	Survey	Interview	Documentation
GS5-#16 Customize instruction to the needs of the learner	Once per week (44.8%) to Once per day (44.8%) (89.2% of all respondents)	Teacher – Not observed Principal – Not observed	Apollo Program Brochure: Mini lessons offered/requested Learner Agency Continuum: Instruction/Established: "Small group and individual instruction continues while others proceed with their learning."
GS5-#17 Differentiated delivery of instruction for various learning styles	Once per week (44.8%) to Once per day (37.9%) (82.7% of all respondents)	Teacher – Not observed Principal – Not observed	Apollo Program Brochure: Mini lessons offered/requested
GS5-#18 Use differentiated pacing for groups of students within a classroom	Once per month (39.3%)	Teacher – Not observed Principal – Not observed	CYSD Ideal Learning Experience Placard: Is met at his/her level of learning
GS5-#19 Use learning contracts to provide for self-pacing and targeted independent practice	Inconclusive trend: some using Once per week (29.6%), Once per day (29.6%), to Never Implemented (29.6%)	Teacher - Not observed Principal - Not observed	Not observed
GS5-#20 Use formative assessment	Once per day (42.9%)	Teacher – Not observed Principal – Not observed	Not observed

Table 31 (continued)

GS5-#21 Alternative means for students to demonstrate mastery (e.g., use of projects, presentations)	Once per week (39.3%)	Teacher – Not observed Principal – Encouraging faculty to increase usage of alternative projects	Apollo Program Brochure: Mastery Learning
GS5-#22 Use of multiple assessments to ensure mastery	Once per week (46.4%)	Teacher – Not observed Principal – Not observed	Not observed

6.7   COLLEGIAL SCHOOL CULTURE INFLUENCING SYSTEMIC CHANGE (GUIDING SUPPORT 7)

6.7.1   Description of a collegial school culture at Central York High School

Feedback from data describes a mixed environment of perceptions and beliefs related to a collegial school culture. Survey data indicated varied levels of teamwork with long-term systemic planning and focus on visioning goals occurring most frequently once per month. There was evidence that individual classroom practice and decision-making is well supported in the building. Opportunities to engage in collegial support to enhance classroom practice is most frequently occurring once per week.   Interviews revealed a school culture with mixed perceptions. The principal's comments reveal his goal of empowerment for teachers to make individual decisions related to planning and practice, further supported by the teacher's statement that teachers are given autonomy in their classrooms. While she did not elaborate on this topic, the context of the conversation described an environment where lessons and pacing can be modified without administrative impediments. The principal stated that he is attempting to

create a school culture in which teachers need not be anxious about trying new approaches and methods. Finally, there were no available mappings from the CYHS documentation related to supporting a collegial school culture.

Congruent to Coburn's (2003) work regarding systemic change, it is easier to quantify collegial activities from the survey and the interviews rather than attempt to measure an overall conceptual change at Central York High School. The data facilitate the description of the school as a work in progress, goal-oriented towards an enhanced and facilitated collegial culture, although the goal is not fully realized at the time of this study.

6.7.2   Mapping of collegial school culture at Central York High School to literature

Two sources reveal data that are organized in Table 32. The data table maps both survey and interview anecdotal information. Documentation did not present any concept mappings to collegial school culture in the study.

Table 32. *Concept Mappings to Collegial School Culture Influencing Systemic Change (GS7)*

Guiding Support 1 (GS7): Collegial School Culture Influencing Systemic Change	Data Sources/Evidence		
Concepts	Survey	Interview	Documentation
GS7-#26 Engage in collegial support to empower and enhance individual classroom practice	Once per week (44.4% of all respondents)	Teacher - Observed: teachers are permitted to do what they need to do in their classrooms Principal - Observed: made reference to building capacity and expertise from within	Not observed
GS7-#27 Plan with colleagues and administration for long-term systemic change	Once per month (48.2% of all respondents)	Teacher – Not observed Principal – Not observed	Not observed
GS7-#28 Engage in teamwork with colleagues	Varied between Once per month, Once per week, Once per day (96.3% of all respondents)	Teacher – Not observed Principal – Not observed	Not observed
GS7-#29 Have a shared vision among teachers and administrators regarding professional goals for present and future	Once per month (46.4% of all respondents)	Teacher - Observed: expressed concerns about a disconnect between messages to students versus CYHS goals Principal - Observed: alignments of vision to individual differentiated supervision plans	Not observed

6.8   PRIORITIZATION OF SUPPORTS

In Chapter 5 (Section 5.5), the study revealed a disconnect between ranked participants' perceptions of guiding supports and their perceptions of how administration would rank the guiding supports. This is an intriguing finding, as it has the potential to initiate dialogue on this topic between the teachers and the principals. A summary of the top two prioritized guiding supports is provided in Table 33.

Table 33. *Top Two Priorities of Guiding Supports of Teachers versus Principals*

Guiding Support	Teacher Ranking (Top 2)	Principal Ranking (Top 2)
Readily Available Technology for ALL Students (GS2)		1
Professional Development for Teachers (GS1)		2
Diagnosis of Relevant Learner Characteristics (GS4)	1	
Collegial School Culture Influencing Systemic Change (GS7)	2	

The table indicates differences in the priorities of teachers versus principals. Teachers highly prioritize Diagnosis of Relevant Learner Characteristics and Collegial School Culture Influencing Systemic Change. Principals highly prioritize Readily Available Technology for ALL Students and Professional Development for Teachers. As the survey was used to disclose

these priorities, interviews and documentation may serve as an additional lens into this particular analysis.

In the interview, both the teacher and the principal indicated struggle with Guiding Support (GS4), Diagnosis of Relevant Learner Characteristics, concept #14, "Ensure that every learner has appropriately challenging material for his/her skill level that is not the same as every other student." All three documentation sources are mapped to concepts in GS4, inclusive of concept #14. This may indicate a need for exploration and understanding of this concept among teachers and principals. Teachers also highly prioritized Guiding Support 7 (GS7), Collegial School Culture Influencing Systemic Change. Interviews indicate alignment to GS7 concept #26, "Engage in collegial support to empower and enhance individual classroom practice" but fall short of endorsement that this concept is in practice consistently. Both the teacher and the principal interviews infer a need for collaboration, particularly to create a shared vision of the high school. There is no documentation that aligns to concepts in GS7, indicating further need for exploration.

Principals placed their highest priority on Guiding Support 2 (GS2) Readily Available Technology for ALL Students. Survey responses, interviews, and documentation have extensive mappings to GS2, particularly in the area of mobile device availability provided by the high school for student use. One minor issue is that the teacher interview indicated no discussion regarding GS2, concept #8, "Use technology to individualize instruction." It may be possible that this teacher is not using learning management software in her classroom. There appears to be substantial focus on technology use in this school, supported by a high prioritization from the principals. Principals indicated a high priority with Guiding Support 1 (GS1) Professional

Development for Teachers. It is important to note that teachers prioritized this as their *third* highest priority.

Data collected on professional development appears to elaborate on this topic across all three data sources. At the outset of this study, I proposed professional development in the conceptual framework as an "essential starting point." Further supporting the survey data, both interview transcripts and artifacts revealed evidence of limited and inconsistent professional development as a concern for Central York High School. There is a lack of consistency in time and training, as well as "who" receives professional development. Perhaps most notably, the participants indicated that their historical professional development is exclusively dependent on educators inside of their school, excluding external sources of professional learning. Central York High School encourages teachers to look to each other for best practices, rather than to research sources of professional learning outside of the organization. Teachers perceive that current professional development lacks a strategic focus related to their comprehensive personalized learning endeavors. Professional development, as a whole, may need additional analysis at Central York High School.

6.9   LOOKING FORWARD

Within this chapter, I have addressed the synthesis of both quantitative and qualitative data sources found in Chapters 4 and 5. It is important to note that concepts mapped from practice to literature present an opportunity for deliberation and recommendations. Findings and recommendations are discussed in Chapter 7.

7.0   RECOMMENDATIONS AND IMPLICATIONS

As a prelude to this study, I reviewed literature revealing seven guiding supports that are recommended for schools to effectively obtain a personalized learning model. Through the case study, I examined a high school asserting that personalized learning happens for students in their school. The literature helped me propose a conceptual framework comprised of seven guiding supports, grouped in a hypothetical sequence, designed to expand the capacity of educators to engage students in personalized learning.

During the data collection phase of this research, I conducted surveys and interviews of teachers and administrators, and examined documentation produced by educators, and offered answers to the following research questions:

1. How is personalized learning described in a school professing to implement 'personalized learning?'

2. How does the concept of personalized learning in a school map onto seven guiding supports of personalized learning strategies drawn from the literature?

The data derived from surveys, interviews and documentation are presented in Chapters 4 and 5. In Chapter 6, I described the professional practices of the school and mapped those onto the seven guiding supports of personalized learning proposed in the conceptual framework. This chapter presents the recommendations and implications relative to the research questions. I also provide recommendations for future research on this topic.

7.1   NEED FOR ENHANCED PROFESSIONAL LEARNING

Literature related to the effectiveness of approaches to traditional professional development has documented shortcomings for many years (Darling-Hammond, Chung Wel, Andree, Richardson, & Orphanos, 2009).   Recall that two of three data sources implicated that professional development was limited because it was confined within the school. Professional development offerings for teachers were deemed inequitable.   School leaders might offer flexibility and availability of professional learning for teachers to personalized learning practices, similar to expectations of teachers to create environments of learning that are personalized for students. Central York High School would benefit by explicitly stating professional learning goals for the teaching staff, specifying a baseline duration of time to engage in professional learning, and seeking professional learning opportunities beyond the walls of the school.

One potential strategy is the creation of "network improvement communities" (Bryk, Gomez, Grunow, & Lemahieu, 2015).   The Carnegie Foundation for the Advancement of Teaching proposes this strategy as an option for schools that seek to generate iterative deliberation and to alleviate concerns of teachers through professional learning. This approach organizes professionals around a common interest and then implements a cycle of examination, based upon six guiding principles:

1. Make the work problem specific and user-centered.

2. Focus on variation in performance.

3. See the system that produces various outcomes.

4. We cannot improve at scale what we cannot measure.

5. Anchor practice improvement in disciplined inquiry.

6. Accelerate improvements through networked communities (Bryk et al., 2015).

A framework for educators to plan their own professional learning may help personalized learning opportunities to blossom and grow within the school. Such a framework could serve Central York High School well in school improvement efforts, furthering the school's progression toward an optimized target: a collegial school culture supporting systemic change.

7.2   REVISION OF CONCEPTUAL FRAMEWORK

Based on the review of literature in Chapter 2, I proposed a conceptual framework for this study. The original conceptual framework is displayed in Figure 12.
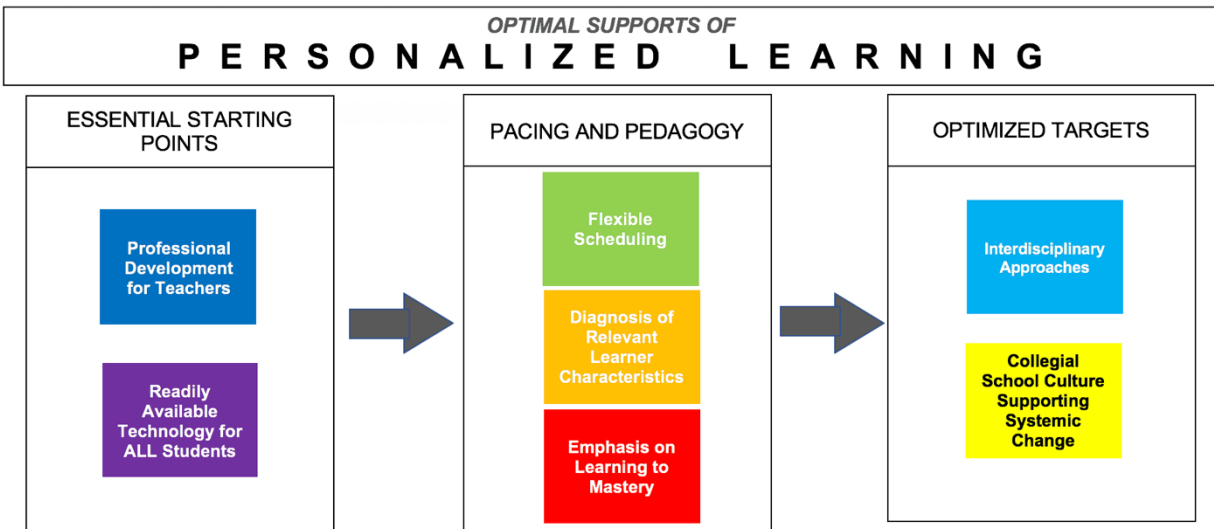
Figure 12. Conceptual Framework of Personalized Learning (Original to Study)

While this framework served well as an operational feature for the study, results challenge the original model. The framework does not aid in the determination of how a school would *practically* go about designing or implementing personalized learning. For example, the

arrows in the conceptual framework were intended to show progression, however, data did not support the notion of progression. Figure 13 offers a revised conceptual framework design.
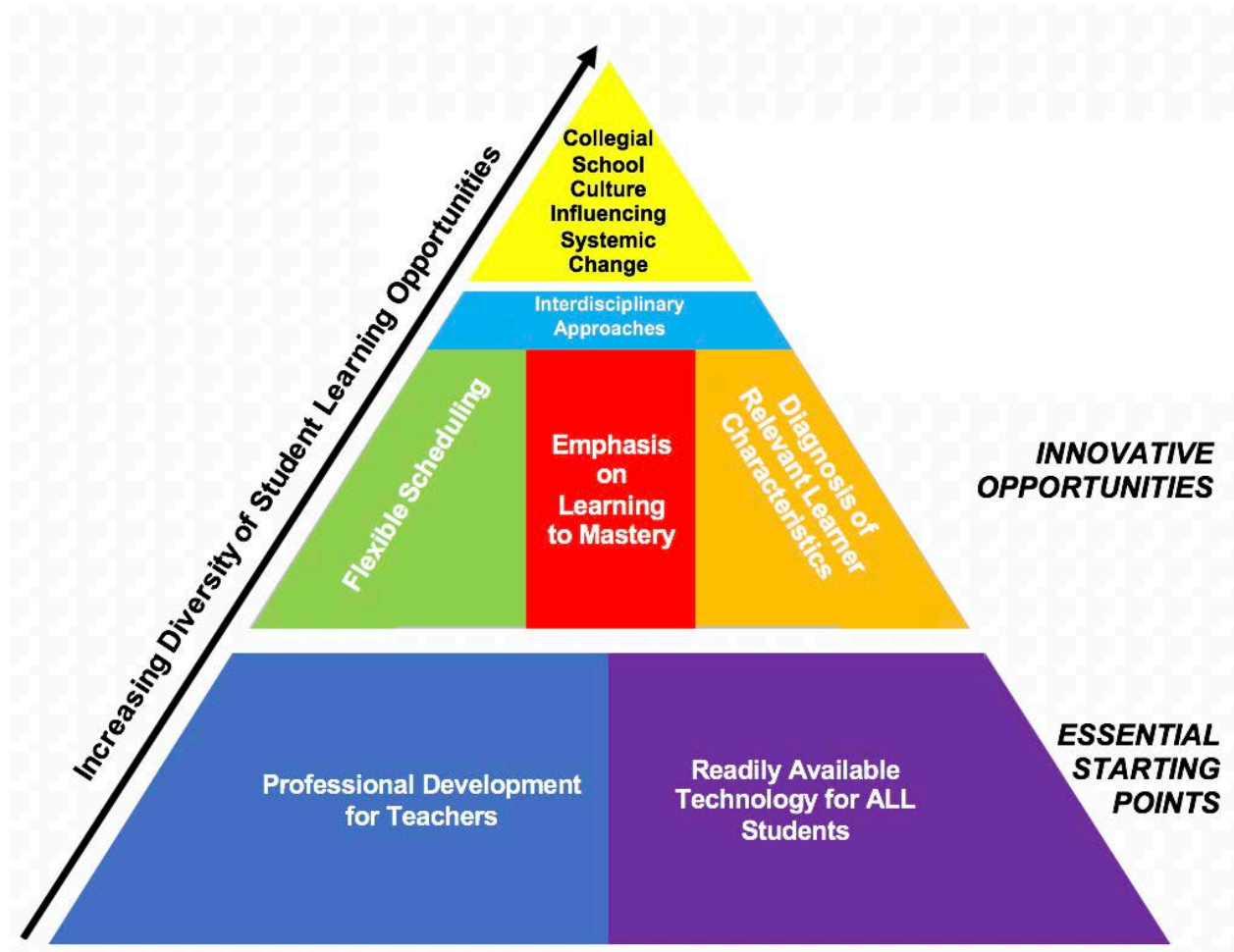

Figure 13. Conceptual Framework of Personalized Learning (Revised)

In this figure, a sequential progression is inherent in the design, but vertical progression is dependent on success in the foundation (i.e., Essential Starting Points). This high school may increase their diversity of student learning opportunities by making an upward progression through the pyramid. Essential starting points serve as a baseline of operational needs, to be offered as consistently and equitably as possible. Without the foundation of adequate

professional development and access to technology, data analysis from this case indicates limited success in progressing to more innovative learning opportunities for students. Sinatra (2000) describes learning as "autonomous requiring an active, self-constructed intentional process." This definition applies to the intentional process of professional learning, and subsequent classroom implementation, required to increase a school's diversity of student learning opportunities. Interdisciplinary approaches stretch as a band across the three guiding supports below it (i.e., Flexible Scheduling, Emphasis on Learning to Mastery, and Diagnosis of Relevant Learner Characteristics) to represent how interdisciplinary approaches assimilate these three guiding supports. This is strategic to the redesign of my model. According to the Partnership for 21st Century Skills Framework Definitions document, educators are encouraged to "promote understanding of academic content at much higher levels by weaving 21st-century interdisciplinary themes into core subjects" (P21, 2009, p. 2). At the pinnacle of the pyramid, a collegial culture becomes the capstone or outcome brought to a school by the coalescence of all other guiding supports. The revised conceptual framework may potentially illuminate opportunities for enhanced professional learning. The framework may also facilitate consensus of priorities among educators within the school.

7.3   IMPLICATIONS FOR FUTURE RESEARCH, PRACTICE AND POLICY

This study serves as one case to explore, expand, and further define personalized learning in educational settings. Since this dissertation represents a single case of a high school, additional studies can better determine similarities and differences among cases, deepen understanding of promising educational practices, and explore research-based conceptual frameworks similar to

the one suggested in this study. Studies are needed where additional literature-based themes could be further explored to refine a conceptual framework. Additional studies across multiple cases may determine whether or not such a conceptual framework could serve as a roadmap to implementation.

Personalized learning is currently a high-interest topic in professional practice, yet the term has not been adequately defined. Educators might benefit from unified explanations of how personalized learning impacts expectations of performance at the local, state and federal levels. Research specific to personalized learning might help to provide clarified definitions that promote further investigation. Eventually, additional research influences the creation of policies that support further research and practice. Because personalized learning is a fairly new way of thinking and organizing educational practice, and because there is limited research to date, it may be too early to generate implications regarding policy.

7.4   THE EMERGENCE OF HEURISTIC THINKING

At the end of this study, I have found myself troubled by the conceptual rendering discussed in this study. I thought I had come upon a new applicable model. I quickly noticed that the graphic could be changeable, depending upon the conditions that exist within a school. I engaged with colleagues during the defense of this dissertation, and together we came to realize that a model does not work, but that a heuristic would be a better vehicle to inspire thinking. I realized that the guiding supports have tremendous variety in terms of priority, emphasis, timeline, feasibility, and sequence, depending on the contextual circumstances.

Dr. Cindy Tananis and I discussed the heuristic approach at length (personal communication, July 28, 2018). We think that educators could benefit from studying personalized learning through engagement with a democratic approach, strategically empowering deeper thinking about learning. Some say that personalized learning looks like this or that, but we have wondered what it really looks like. The point here is that it could not possibly look like any one thing. It is a malleable and flexible expression of learning, further differentiated by individual learner needs.

We came back to the notion of thinking heuristically, briefly foreshadowed in Chapter 4. The heuristic way of thinking is not a model to be followed or a precise set of steps to be mastered. Much of what I observed in the guiding supports could be valid approaches, but they are certainly not the sum total of instructional practices to be discovered or implemented. Dr. Tananis shared that the complexity of this heuristic process is varied; it is dependent on the "flavor" of an educational setting, the needs of its surrounding community, the desires of the educators who work there, the school board that governs it, all of which would influence the ways in which a group of leaders could deliberate on an issue, inclusive of multiple perspectives (personal communication, July 28, 2018).

Some educators will use the term "best practice," a concept that guides practitioners to follow a model. The work of this study has led me to think about Dr. Tananis' assertion that "better practices" are framed by a heuristic way of thinking, whereas differences in conditions (i.e., context, setting, sequencing of guiding supports) allow the practitioner to show evidence in justification of practice (personal communication, July 28, 2018). She further asserts that there could not possibly be a "best practice" because the work of learning is too dependent on the situation and context (personal communication, July 28, 2018). Mindful of the decision-making

context of schools, whereas school boards and school leaders are charged with the responsibility of planning and preparation, we do not need adaptive and skilled leadership to follow a model (C. Tananis, personal communication, July 28, 2018). However, school leaders could be empowered by developing a heuristically-led way of thinking. Educators in this environment would need humility, deliberative skill, flexible thinking, and the capacity to resist suppression of unfamiliar ideas.

From the perspective of an educational leader, the profession needs educators who are willing to instill a thirst for learning; who will often respond to student inquires with, "I don't know the answer to your question, so let us investigate that issue together." Our profession does not need teachers to spew knowledge, for that work could be accomplished by a robot. We don't want a robot. We want the educators and leaders of educators to exemplify the capacity to solve problems with a deliberative, collaborative, and thoughtful approach to "learning to think." Future generations of both learners and educators deserve nothing less.

7.5   THIS RESEARCHER'S PROFESSIONAL GROWTH

The experience of completing a dissertation on personalized learning sparked significant personal interest in this topic for me. While the study helped to provide insight into teacher and principal perceptions of, and experiences with, personalized learning, it also uncovered several unanswered questions and opportunities for future exploration. This inquiry inspired me to continue my pursuit of how school leaders seek to improve teaching and learning in educational settings.

Engagement in analytical thinking is requisite to the research journey. The dissertation process served as a wonderful teacher, teaching me to value objectivity in data analysis and attempt to describe nuances across professional experience. It also allowed me to engage with a written narrative that plainly expresses how this study, and subsequent studies, could serve to enhance the readiness of educators to provide personalized learning opportunities for students in their classrooms, potentially guiding school-wide improvement initiatives. The research process has the potential to serve others beyond the scope of this study.

I had a frequent epiphany to the concept of "tropes" from a course at the beginning of my doctoral studies, specifically the University of Pittsburgh ADMPS Core 1 course. In a think piece, Garman and Gunzenhauser (2011) introduce the concept of tropes, specifically designed to stimulate discourse as "particular words that are crafted to construct language text for the purpose of emergent knowledge, and, as such, they provide situations of struggle" (p. 3). The struggle of analysis is real for a doctoral student. While navigating the struggles found in the discourse of this study, I frequently found myself coming back to take a deeper dive into how the literature supports this study's conceptual framework of personalized learning. My intent is that this study, along with the conceptual framework, may provide an impetus for future research and deliberation. The dissertation caused me to further acknowledge and analyze my strengths and weaknesses as a thinker and writer, as a scholar and as a practitioner.

Personalized Learning: A Case Study of Implementation in a High School

Survey Flow

Block: Demographics (6 Questions)
Standard: Guiding Support 1: Learning to Mastery (GS1) (1 Question)
Standard: Guiding Support 2: Diagnosis of Relevant Learner Characteristics (GS2) (1 Question)
Standard: Guiding Support 3: Collegial Culture Supporting Systemic Change (GS3) (4 Questions)
Standard: Guiding Support 4: Flexible Scheduling (GS4) (2 Questions)
Standard: Guiding Support 5: Interdisciplinary Approaches (GS5) (1 Question)
Standard: Guiding Support 6: Coaching for Teachers and Students (GS6) (1 Question)
Standard: Guiding Support 7: Technology for All Students (GS7) (4 Questions)
Standard: Final Inputs (4 Questions)
Standard: Epilogue (3 Questions)

Page
Break

Q1 Please indicate your current position

◯ Teacher (1)

◯ Administrator (2)

Q2 Indicate the content area(s) in which you are currently teaching. Please select all applicable.

☐ Art (1)

☐ Business, Computer and Information Technology (BCIT) (2)

☐ Driver Education (3)

☐ English/Language Arts (4)

☐ Family and Consumer Science (5)

☐ Health and Physical Education (6)

☐ Library Science (7)

☐ Licensed Social Worker (8)

☐ Mathematics (9)

☐ Music (10)

☐ School Counselor (11)

☐ School Nurse (12)

☐ Science (13)

☐ Special Education (14)

☐ Social Sciences (15)

☐ Technology Education (16)

☐ World Language(s) (17)

Q3 Indicate the highest degree that you have earned to date.

○ Bachelors Degree (1)

○ Masters Degree (2)

○ Doctoral Degree (3)

Q4 Please indicate the TOTAL number of years that you have worked in education.

○ 0-5 years (1)

○ 6-10 years (2)

○ 11-15 years (3)

○ 16-20 years (4)

○ 21-25 years (5)

○ 26-30 years (6)

○ 31-35 y ears (7)
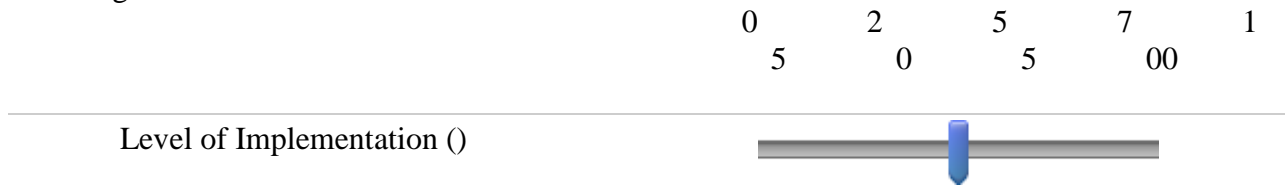
○ 36 or more years (8)

Q5 Please indicate the TOTAL number of years that you have worked in education AT YOUR CURRENT SCHOOL.

○ 0-5 years (1)

○ 6-10 years (2)

○ 11-15 years (3)

○ 16-20 years (4)

○ 21-25 years (5)

○ 26-30 years (6)

○ 31-35 years (7)

○ 36 or more years (8)

Page
Break

Q6 Personalized Learning is described as "a vision where learning systems may abandon the industrial, time-based approach to instruction and replace it with a contemporary learning-based system that fulfills every learner's need at his/her present performance level."

Using this description, with zero representing no implementation and 100 representing complete implementation, how close is your school to achieving the goal of implementing personalized learning for all students?

| | 0 | 2 | 5 | 7 | 1 |
| | | 5 | 0 | 5 | 00 |

Level of Implementation ()

Q7 Assess to what extent you implement students learning to mastery as defined in the descriptions below.

	I have never implemented this strategy (1)	I occasionally implement this strategy (at least 1x per month) (2)	I frequently implement this strategy (at least 1x per week) (3)	I regularly implement this strategy (at least 1x per day) (4)
Q7.1 Customize instruction to the needs of the learner (1)	○	○	○	○
Q7.2 Differentiate delivery of instruction for various learning styles (2)	○	○	○	○
Q7.3 Use differentiated pacing for groups of students within your classroom (3)	○	○	○	○
Q7.4 Use learning contracts to provide for self-pacing and targeted independent practice (4)	○	○	○	○
Q7.5 Use formative assessment (5)	○	○	○	○
Q7.6 Offer alternative means for students to demonstrate mastery, such as	○	○	○	○

projects or
presentations (6)

Q7.7 Use
multiple
assessments to   ○   ○   ○   ○
ensure mastery
(7)

Q8 Assess to what extent you diagnose relevant learner characteristics as defined in the descriptions below.

	I have never implemented this strategy (1)	I occasionally implement this strategy (at least 1x per month) (2)	I frequently implement this strategy (at least 1x per week) (3)	I regularly implement this strategy (at least 1x per day) (4)
Q8.1 Plan and design instructional activities that are commensurate with the student's readiness (1)	○	○	○	○
Q8.2 Use developmentally appropriate presentations for small groups (2)	○	○	○	○
Q8.3 Ensure intellectual readiness (3)	○	○	○	○
Q8.4 Ensure that every learner receives challenging material individually matched to his/her skill level (4)	○	○	○	○
Q8.5 Adjust tasks (e.g., assignments, projects, presentations) for students' varying interest levels (5)	○	○	○	○

Q9 My district provides time in the work week for shared collaboration (e.g., Professional Learning Community, common planning time)

○ Yes (1)

○ No (2)

Q10 How much time is provided *on a weekly basis* to you intended for collaboration with colleagues?

○ No time is provided. (1)

○ 1-20 minutes (2)

○ 21-40 minutes (3)

○ 41-60 minutes (4)

○ 61-80 minutes (5)

○ 81-100 minutes (6)

○ 101-120 minutes (7)

○ 121 minutes or more (8)

Q11 With zero representing no collaborative time and 100 representing complete satisfaction with collaborative time, to what extent do you think that the collaborative time provided with colleagues is adequate?

| | 0 | 2 | 5 | 7 | 1 |
| | 5 | 0 | 5 | 00 | |

Level of Adequacy ()

148

Q12 Assess to what extent you engage in the practice of sustaining a collegial school culture as defined in the descriptions below.

	I have never implemented this practice (1)	I occasionally implement this practice (at least 1x per month) (2)	I frequently implement this practice (at least 1x per week) (3)	I regularly implement this practice (at least 1x per day) (4)
Q12.1 Engage in collegial support to empower and enhance my classroom practice (1)	○	○	○	○
Q12.2 Plan with my colleagues and administration for long-term systemic change (2)	○	○	○	○
Q12.3 Engage in teamwork with colleagues (3)	○	○	○	○
Q12.4 Have a shared vision among teachers and administrators regarding goals for the present and future (4)	○	○	○	○

Q13 With zero representing no control and 100 representing complete satisfaction with your current level of control, to what extent do you have control over time devoted to teaching lessons and providing individualized pacing for students, as opposed to the boundaries of the bell schedule?

0	2	5	7	1
5	0	5	00	

Level of Control ()

- -

Q14 With zero representing no student schedule flexibility and 100 representing complete satisfaction with student schedule flexibility, to what extent do you think that the flexibility in student scheduling is adequate?

0	2	5	7	1
5	0	5	00	

Level of Flexibility ()

Q15 Assess to what extent you engage in the practice of interdisciplinary instruction as defined in the descriptions below.

	I have never implemented this practice (1)	I occasionally implement this practice (at least 1x per month) (2)	I frequently implement this practice (at least 1x per week) (3)	I regularly implement this practice (at least 1x per day) (4)
Q15.1 Have time for interdisciplinary teaming and planning for instruction across curricular areas (1)	○	○	○	○
Q15.2 Teach concepts through projects that span multiple academic disciplines (2)	○	○	○	○
Q15.3 Have scheduled time during the school day for collaboration, decision-making, scheduling, grouping, and cross-integration of academic content (3)	○	○	○	○

End of Block: Guiding Support 5: Interdisciplinary Approaches (GS5)

Start of Block: Guiding Support 6: Coaching for Teachers and Students (GS6)

Q16 Assess to what extent you engage with professional development activities as defined in the descriptions below.

	I have never implemented this practice (1)	I occasionally implement this practice (at least 1x per month) (2)	I frequently implement this practice (at least 1x per week) (3)	I regularly implement this practice (at least 1x per day) (4)
Q16.1 Engage in intra-district professional development to support personalized learning (1)	○	○	○	○
Q16.2 Engage in professional development for new teaching strategies and new curriculum content prior to any expectation of classroom implementation (2)	○	○	○	○
Q16.3 Engage in professional development specific to my content area (3)	○	○	○	○
Q16.4 Participate in professional development aligned to my own professional goals and interests (4)	○	○	○	○

Q17 Does each student have access to a mobile device (e.g., laptop, iPad, Chromebook) in your classroom for daily use?

○ Yes (1)

○ No (2)

Q18 May students take their mobile device home on a regular basis?

○ Yes (1)

○ No (2)

Q19 Does each student have access to a learning management system (e.g., Moodle, Schoology, etc.) to engage with academic content?

○ Yes (1)

○ No (2)

Q20 With zero representing no individualized instruction and 100 representing complete satisfaction with student individualized instruction, to what extent do you think that the individualized instruction as a result of technology usage is adequate?

| | 0 | 2 | 5 | 7 | 1 |
| | 5 | 0 | 5 | 00 | |

Adequacy of Individualized Instruction ()

Q21 How would you, individually, rank order the importance of the guiding supports for personalized learning?

_____ Collegial School Culture Influencing Systemic Change (1)
_____ Diagnosis of Relevant Learning Characteristics (2)
_____ Emphasis on Learning to Mastery (3)
_____ Flexible Scheduling (4)
_____ Interdisciplinary Approaches (5)
_____ Professional Development for Teachers (6)
_____ Readily Available Technology for ALL Students (7)

Q22 How do you perceive that school administration would rank order the importance of the guiding supports for personalized learning?

_____ Collegial School Culture Influencing Systemic Change (1)
_____ Diagnosis of Relevant Learning Characteristics (2)
_____ Emphasis on Learning to Mastery (3)
_____ Flexible Scheduling (4)
_____ Interdisciplinary Approaches (5)
_____ Professional Development for Teachers (6)
_____ Readily Available Technology for ALL Students (7)

Q23 What additional resources do you deem necessary to enhance personalized learning in your school?

_____

_____

_____

_____

_____

Q24 Is there anything else that you would like to share about personalized learning practices in your school?

_____

_____

_____

_____

_____

Q25 As a follow-up to this survey, I would like to have a brief conversation to more fully understand personalized learning in your classroom or building. Interviews will be held once, for a duration of approximately 10-15 each. Interviews would be scheduled as a mutually-agreed upon date and time.

Answer YES if you would be interested in participating in a follow-up personal interview.
Answer NO if you are not interested in a follow-up personal interview.

○ YES (1)

○ NO (2)

Q26 Since you answer YES to the previous question, please indicate your First Name and Last Name. Further, I also ask that you provide an email address and contact phone number so that I may reach out to you for a personal interview.

○ First Name (1) _____

○ Last Name (2) _____

○ Email Address (format: yyy@yyy.com (3)
_____

○ Phone Number (format: xxx-xxx-xxxx) (4)
_____

EXIT Thank you for your participation this survey! We appreciate your investment of time.

Regards,

Matt Thomas, Doctoral Student, University of Pittsburgh
Dr. Cynthia Tananis, Associate Professor, Doctoral Advisor, University of Pittsburgh

End of Block: Epilogue

APPENDIX B

INSTITUTIONAL REVIEW BOARD APPROVAL LETTER

University of Pittsburgh
Institutional Review Board

3500 Fifth Avenue
Pittsburgh, PA 15213
(412) 383-1480
(412) 383-1508 (fax)
http://www.irb.pitt.edu

Memorandum

To: Matthew Thomas
From: IRB Office
Date: 2/21/2018
IRB#:   PRO17110277
Subject: Personalized Learning: A Case Study of Implementation in a High School

The above-referenced project has been reviewed by the Institutional Review Board. Based on the information provided, this project meets all the necessary criteria for an exemption, and is hereby designated as "exempt" under section

45 CFR 46.101(b)(1)

Please note the following information:

- Investigators should consult with the IRB whenever questions arise about whether planned changes to an exempt study might alter the exempt status. Use the **"Send Comments to IRB Staff"** link displayed on study workspace to request a review to ensure it continues to meet the exempt category.
- It is important to close your study when finished by using the **"Study Completed"** link displayed on the study workspace.
- Exempt studies will be archived after 3 years unless you choose to extend the study. If your study is archived, you can continue conducting research activities as the IRB has made the determination that your project met one of the required exempt categories. The only caveat is that no changes can be made to the application. If a change is needed, you will need to submit a NEW Exempt application.

Please be advised that your research study may be audited periodically by the University of Pittsburgh Research Conduct and Compliance Office.

APPENDIX C

INVITATION TO PARTICIPATE IN THE STUDY – TEACHERS

Dear Teacher,

My name is Matt Thomas, and I am a doctoral student at the University of Pittsburgh. I am also a Curriculum Administrator at the Westmoreland Intermediate Unit 7, located in Greensburg, Pennsylvania. I am conducting a dissertation research study on the topic of personalized learning in secondary school. This email is an invitation for you participate in this brief survey. I am sending it to all teachers in your school, [insert name of school here.]

I know how busy you are as a teacher. It is strategically a brief survey to encourage a high number of respondents from your school. Therefore, this survey should take you no more than fifteen minutes to complete. This link below will take you to the survey: [insert Qualtrics link here]

Please know that you will incur minimal risk through this study and may decline to answer any questions during the survey. The primary potential risk is a breach of confidentiality, but everything possible will be done to protect your privacy. All records pertaining to your involvement in this study will be kept locked, and any data that includes your identity will be

stored in secured files. Your identity will not be revealed in any description or publication of the research. <u>Individual</u> responses will not be shared with any supervisor at your school district.

One of the survey questions asks if you would be willing to participate in a follow-up interview. This interview contains questions about when, how, and for what purpose you engage in personalized learning with your students. I expect an interview conversation to last no longer than thirty minutes, and we can arrange to conduct it over the phone. If you are willing to be considered for an interview, please provide your contact information when prompted by the survey.

Thank you for your consideration and assistance. If you have any questions, please feel free to contact me via email (mpt@pitt.edu) or by phone at 814-242-5531. I sincerely appreciate your time and consideration as we complete this study.

Sincerely,

Matt Thomas

Matthew P. Thomas
Email: mpt@pitt.edu
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APPENDIX D

INVITATION TO PARTICIPATE IN THE STUDY – PRINCIPALS

Dear Principal,

My name is Matt Thomas, and I am a doctoral student at the University of Pittsburgh. I am also a Curriculum Administrator at the Westmoreland Intermediate Unit 7, located in Greensburg, Pennsylvania. I am conducting a dissertation research study on the topic of personalized learning in secondary school. This email is an invitation for you participate in this brief survey. I am sending it to all teachers in your school, [insert name of school here.]

I know how busy you are as an administrator. It is strategically a brief survey to encourage a high number of respondents from your school. Therefore, this survey should take you no more than fifteen minutes to complete. This link below will take you to the survey: [insert Qualtrics link here]

Please know that you will incur minimal risk through this study and may decline to answer any questions during the survey. The primary potential risk is a breach of confidentiality, but everything possible will be done to protect your privacy. All records pertaining to your involvement in this study will be kept locked, and any data that includes your identity will be

stored in secured files. Your identity will not be revealed in any description or publication of the research. <u>Individual</u> responses will not be shared with any supervisor at your school district.

One of the survey questions asks if you would be willing to participate in a follow-up interview. This interview contains questions about when, how, and for what purpose you engage in personalized learning with your students. I expect an interview conversation to last no longer than thirty minutes, and we can arrange to conduct it over the phone. If you are willing to be considered for an interview, please provide your contact information when prompted by the survey.

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