Every individual must, in order to acquire the art of reading in the shortest possible time, be taught quite apart from any other, and therefore there must be a separate method for each. That which forms an insuperable difficulty to one does not in the least keep back another, and vice versa. One pupil has a good memory, and it is easier for him to memorize the syllables than to comprehend the vowellessness of the consonants; another reflects calmly and will comprehend a most rational sound method; another has a fine instinct, and he grasps the law of word combinations by reading whole words at a time.

The best teacher will be he who has at his tongue’s end the explanation of what it is that is bothering the pupil. These explanations give the teacher the knowledge of the greatest possible number of methods, the ability of inventing new methods and, above all, not a blind adherence to one method but the conviction that all methods are one-sided, and that the best method would be the one which would answer best to all the possible difficulties incurred by a pupil, that is, not a method but an art and talent... Every teacher must... by regarding every imperfection in the pupil's comprehension, not as a defect of the pupil, but as a defect of his own instruction, endeavor to develop in himself the ability of discovering new methods...

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MAPPING MASTERY

Building Educator Capacity for Personalized Learning

INTRODUCTION

THIS INTERIM REPORT synthesizes the initial findings from NAATE’s study of personalized learning schools. A comprehensive report will follow when the study is complete in 2017. NAATE would like to thank StartUp Education, the Chan Zuckerberg Initiative, New Schools Venture Fund, and the Carnegie Corporation of New York, whose support made this study possible.

NAATE’s interest in personalized learning schools is an outgrowth of its work with NAATE Teacher Fellows from personalized and blended learning school models. Teacher Fellows from the past several cohorts who serve in these new design schools consistently reported that the NAATE coursework helped them in their daily practice, both with students and in their evolving roles outside the classroom. They also suggested that, given the shifts in expectations of their practice, they would benefit from more professional learning. Thus, NAATE set out to clarify the competencies required of teachers to deliver on these innovative approaches to student learning and to better understand how well its current programming meets these teachers’ needs.

NAATE retained a team of both staff and external consultants to conduct research and to observe a set of schools implementing a range of instructional approaches. The study will continue with visits through the spring of 2017. To date, the team has conducted multi-day visits to eight schools, representing both stand-alone charter schools and four charter school networks. The team interviewed education researchers, senior leaders at the network level, teachers, students, instructional coaches, and school leaders.

The study’s intended purpose is fourfold: 1) to identify what competencies teachers need to serve students in these new school models, 2) to determine priority areas for professional support that would benefit educators in these settings, 3) to understand to what extent the current NAATE program addresses the needs of teachers, and 4) to identify specifically how NAATE might strengthen its capacity to meet the unique professional learning needs of educators in these schools.
DEFINING PERSONALIZED LEARNING

Personalized learning models have generated increasing interest in the K-12 field. The definition of personalized learning is varied and broad, and the practice of it is dynamic, experimental, and iterative. Schools based on these models have diverse approaches to personalizing students’ educational experiences. In some schools, learning is primarily personalized via blended learning platforms; in others, via one-on-one tutoring; in still others, through intentional approaches to individualized social and emotional development. A wide range of schedules, methods, and activities appear in personalized learning settings: students may work most of the day on their own or in small groups, or they may follow more traditional schedules with portions of the day carved out for individual skill acquisition, or they may engage in project-based work. This report’s findings are not meant to describe any one given model comprehensively. Rather, the findings distill learning from across a range of models and are meant to help identify which professional competencies are most critical for teachers to possess in order for students to take full ownership of their learning and meet the promise of personalized learning.

CROSS-WALKING THE PERSONALIZED LEARNING FRAMEWORKS

NAATE launched its study with a review of the leading personalized/blended learning educator competency frameworks. The team analyzed these frameworks and grouped them using broader categories to make them more accessible to users (see Appendix). All frameworks include descriptions of knowledge, skills, and mindsets necessary for educators in these settings. While each framework classified the competencies differently, the substance of the competencies themselves closely overlapped.

Many competencies in the personalized learning frameworks mirror those of more traditional frameworks and are universally necessary for student success (e.g. matching instructional methods to the needs of students, assessing data). However, the importance of these competencies is magnified in personalized settings based on the need to meet each and every student where she or he is developmentally. Moreover, the very competencies that have typically been the domain of teachers are, over time, now expected of students themselves. In order for learners to cultivate a sense of agency, autonomy, and ownership of their learning, teachers must be equipped to support students to make decisions about what, where, when, and how to learn. This is a significant shift.

Personalized learning schools have adopted different, and still evolving, structures, and have created different functional roles (e.g. “sandbox coordinator,” advisor, teacher, mentor, circle leader) for staff. The NAATE team emerged from its initial work with the belief that it would be premature to substantively narrow the set of competencies needed of classroom teachers, because in the cases observed, teachers’ responsibilities remain sufficiently broad. While there is some belief in these early stages of school development that teachers might become more specialized and not need to be “all things to all students,” in all of the settings the team visited, teachers are still playing a wide range of roles. They are still pedagogues, and must still be adept in the development of students’ social-emotional and metacognitive needs. There was not a single school in which teachers were only playing the role of content expert or specialist without also serving students in a broader context. To this end, NAATE’s analysis looks at the comprehensive sets of competencies that adults in these settings need, based on current personalized learning models. If, over time, the division of labor shifts and models emerge that enable specialization and narrower sets of competencies, the requirements of each specialist might change. For now, however, the team determined that teachers still need a wide range of skills, knowledge, and mindsets.

HISTORICAL CONTEXT

While technology-enabled personalized learning represents a potentially transformational shift in K-12 education, the origins of personalized learning can be seen in a variety of pedagogies, educational approaches, and philosophies, including: mastery learning, Expeditionary Learning, Montessori and Waldorf schooling, the Coalition of Excellent Schools, competency-based education, and project-based learning. The belief that students
should be at the center of their learning with their teachers serving as coaches or guides is a concept that has been promoted by different educational models for over a century. Many personalized learning school models have adopted elements of these prior models, such as project-based expeditions and small advisory groups. With the advent of new technologies, the extent to which schools will be able to personalize learning is likely to radically increase, providing a multitude of mechanisms for students to manage their own learning.

Throughout this study, the NAATE team found that school leaders and educators in personalized settings are productively grappling with essential questions about teaching and learning, including how to rethink content delivery, cultivate relationships with students, foster student habits, and collect and analyze data. The study is well-timed, coinciding with the schools’ own explorations of how best to equip educators to be successful in their models.

LITERATURE REVIEW

Before launching school visits, the team analyzed four leading frameworks outlining educator competencies in personalized settings: TNTP’s Reimagining Teaching in a Blended Classroom, Jobs for the Future & The Council of Chief State School Officer’s Educator Competencies for Personalized, Learner-Centered Teaching, iNACOL’s Blended Learning Teacher Competency Framework, and the LEAP Learning Framework for Personalized Learning by LEAP Innovations. While each report identifies and organizes its competencies under different categories and weights some more heavily than others, the overall constructs point to key areas necessary for educators to be successful in these settings. The team also reviewed Charlotte Danielson’s 2013 Framework for Teaching, widely viewed as the gold standard for teacher evaluation in traditional settings.

Given the increased complexity of personalized models, it is logical that the personalized learning competency frameworks emphasize teacher habits and mindsets over discrete skills. The personalized learning frameworks expect teachers to be visionary, maintain a growth mindset, take risks, embrace innovation, and remain flexible and student-centered. There is also a greater emphasis placed on collaboration and communication with students as well as peers. In each of the personalized learning frameworks, these “softer skills” —whether called mindsets, qualities, interpersonal, or intrapersonal skills— comprise between 25-50% of the overall framework, whereas for Danielson, that figure is closer to 10%.

A review of Knowledge Works’ recent report, The Shifting Paradigm of Teaching: Personalized Learning According to Teachers, supports the NAATE team’s analysis of the teacher competency frameworks. That report includes personalized learning teachers’ reflections about the importance of three major themes: culture, transparency, and vision. It also reinforces many of the teacher competencies identified in the other reports such as: collecting and monitoring data, working collaboratively, remaining student-centered, embodying a growth mindset, and remaining open-minded about trying new approaches.

Introduction to COMPETENCY FINDINGS

Based on its work to date, the NAATE team has identified five broad domains where additional professional development work would benefit educators in the full range of schools investigated. They include: Pedagogy & Content; Metacognition; Social-Emotional Competence; Data & Assessment; and Teacher Leadership & Adult Learning. The description that follows separates these domains for the sake of organizational clarity. In reality, specific competencies overlap and concepts bridge across the five domains.
While no consensus has emerged on the role content should play in new school designs, there is agreement on the need to tailor learning experiences for individual students. Therefore, the capacity of teachers to choreograph and support students’ learning experiences is key, and requires a sophisticated knowledge of how to design personalized learning experiences, in terms of both pedagogy and content. While pedagogy and content knowledge might be seen as separate domains, the forefather of “pedagogical content knowledge,” Lee Shulman, and subsequent researchers provide a frame for describing the various ways in which pedagogy and content relate: teacher knowledge of content and students, knowledge of content and teaching, knowledge of content and curriculum, and specialized content knowledge. From NAATE’s perspective, the interconnectedness of pedagogical decision-making and content is heightened in personalized learning settings, and their relationship requires teachers to be nimble and responsive.

Each of the personalized learning teacher competency frameworks acknowledges this complex aspect of teacher practice, calling on teachers to:

- Utilize in-depth understanding of content and learning progressions to engage learners and lead individual learners toward mastery (JFF/CCSSO).
- Have broader and deeper content expertise than is typically expected in traditional classrooms (TNTP).
- Create pedagogical approaches and learning experiences that promote content-based problem-solving and online collaboration; Provide resources for students to learn content and enable them to work independently and/or in cooperative groups (iNACOL).
- Collaborate with learners to identify and include learner preferences and optimal learning conditions (e.g. modalities, technology use, the nature and duration of learning activities, pacing, grouping size, and when/where learning will take place) (LEAP).

The Danielson framework and the newly developed personalized competency frameworks all contain elements of practice including instruction, collaboration, data, and classroom management. Yet the associated competencies differ and, most dramatically, teachers’ roles and necessary mindsets shift significantly from the traditional to a personalized learning setting. For example, the LEAP Learning Framework employs the word “partner” to describe the main role that teachers play with learners, and uses verbs such as “co-constructing,” “collaborating,” “encouraging,” and “supporting” to describe their work with students. No such corollaries exist within the Danielson framework.

Personalized learning models have led to a re-examination of the pedagogical and content knowledge necessary for teachers to successfully support student learning. While teachers have traditionally delivered lessons and followed a scope and sequence that they or other adults have controlled, personalized learning educators’ roles have shifted. Teachers are now expected to have facility with a wide array of delivery mechanisms to meet each individual student at his or her level, and to share or even turn over control of the learning process to students. In these settings, students are playing a significant role in determining what, when, where, and how they learn.

Across all of the personalized learning frameworks, students are expected, over time, to direct their learning and make decisions that were previously within the domain of teachers, such as planning how they will learn, analyzing their data, and choosing instructional modalities and materials. To this end, teachers’ control is diminished, while their roles as coaches, influencers, or choreographers are expanded.
The NAATE team’s findings suggest that personalized learning models require as deep an understanding of content and pedagogy as more traditional schools. While there may be some in the K-12 sector who hope that personalized learning models lessen the need for teacher expertise in pedagogy and content, the team did not find this to be the case. While schools are now able to deliver lower-order skill-building learning experiences on blended learning platforms, the need for higher-order engagement of students still rests on the shoulders of teachers.

A key observation from classroom visits and interviews is that the role of teacher has shifted toward that of curator or choreographer of learning experiences. Ideally, teachers are thoughtfully assembling, or co-creating with each student, a set of learning experiences based on a deep understanding of the student, the content or subject, and the available options for learning that, together, are most likely to lead to understanding and mastery. Intentionality in developing and supporting individual pathways for students is key, and requires significant pedagogical content knowledge, which remains a growth area for teachers.

**PRIORITY AREA FOR GROWTH**

**Integration and Coordination of Modes of Learning**

Personalized learning teachers are responsible for facilitating each individual student’s overall learning experience, and, over time are expected to shift the responsibility for managing learning to the student. Schools now have at their disposal a wider variety of avenues for learning and supporting students in reaching their learning goals (ranging from small groups and whole-group discussion to blended learning platforms and individual playlists). Consistently, the team saw educators working to leverage these sets of technologies and instructional resources, and employing different pedagogical models during class time (e.g. Socratic Seminar, individual work time, small group, blended learning platforms). In some instances, these modes of learning tended to function as separate and independent of one another. It was not always apparent to what extent the pedagogical approaches were selected for a purposeful set of learning goals.

With the increase in the number of learning tools at their disposal, teachers are still working to define when and for what purposes they should use which tools. They face an increased set of challenges in creating coherent learning pathways for students. If the purpose of personalization is to help students deepen their understanding and do so at their own pace and in their own place, then the question for teachers is how to choreograph a set of experiences that are appropriately matched to the desired learning objectives given the myriad of new choices.

Amid these choices, teachers also have the added benefit of having access to a rich set of data about students. Ideally, teachers use this data to help them identify students’ skills, knowledge, and areas of need. With the large amount of data being generated in personalized learning environments, it is critical that teachers be supported to appropriately respond to student needs. If a student is struggling on a blended learning platform and having difficulty with a set of math concepts, what should a teacher do? What assignments are appropriate? What is the appropriate intervention? If personalized learning means providing students with tailored, customized experiences aimed at deepening their skills, knowledge and understanding, then utilizing data in ways that are precise, specific, and timely to make adjustments and respond to students’ needs is critical.

All of the schools that the NAATE team visited employed blended learning platforms for skill develop-
ment. When and how these platforms were used varied greatly.

The team found, however, that few educators seem to utilize the data generated from these platforms routinely in their instructional practice; many teachers shared that they did not know what students were working on, or how they were performing on tasks on the platform (i.e. teachers were not reviewing the data being generated by these platforms). The sheer volume of data may be one factor here. In some cases, blended learning platforms are utilized in isolated ways, with some students themselves not consistently or fully engaged. Many of the English Literature Arts platforms focused on grammar and vocabulary based on short passages without the benefit of talk, while math programs emphasized operations, rather than conceptual understanding. The team discovered that many educators view blended learning more as a private time for students to practice and gain fluency than an integrated part of their personalized learning. Often, the data generated from these activities was not directly used by teachers as they crafted pathways for students. In student interviews, it appeared that, for many students, the learning goals or areas for improvement were not clear to them; they were not able to articulate what skills or knowledge they were working to develop. If students sit at the center of their learning, an opportunity exists to more closely couple the blended learning modality and resulting performance feedback into their personal learning pathways.

**Strengths We Observed**

Educators in these settings are embracing a wide array of new models of learning. They are employing various technological tools, and are working to individualize their assignments for students. Impressively, the vast majority of teachers are eager to gain feedback and are looking to find ways to deepen their practice. The mindset of most of the teachers who the NAATE team met was one of openness and commitment to continuous improvement. Many acknowledged that they had many questions about how to use the various tools and data at their disposal to deepen student learning.

**Areas of Opportunity**

As personalized learning models evolve, teachers’ intentionality of how to choreograph, support, and cultivate rich learning experiences will remain critical. In most of the schools visited, the team saw students engaged in a host of activities—indepen- dent group projects, multiple blended learning platforms, research, and whole-group discussion—though it was not always clear what the purpose of each activity was, or how teachers determined when to use each. It became apparent that these various elements of learning are not typically interwoven in integrated ways. Teachers in many settings see the components of student learning as separate from one another, rather than as a cohesive set of experiences that together form a personalized pathway of learning. Blended learning

**Relevant Theory & Research**

As teachers’ time is redistributed to focus on the higher-order aspects of teaching and learning, they must still help determine the pathways for students. As Lee Shulman wrote in his seminal 1987 article, *Knowledge and Teaching Foundations for the New Reform*: “Teaching necessarily begins with a teacher’s understanding of what is to be learned and how it is to be taught. It proceeds through a series of activities during which the students are provided specific instruction and opportunities for learning, though the learning itself ultimately remains the responsibility of the students. Teaching ends with new comprehension by both the teacher and the student. Formulation is drawn from the teacher’s perspective and, hence, may be viewed by some readers as overly teacher-centered. I do not mean to diminish the centrality of student learning for the process of education, nor the priority that must be given to student learning over teacher comprehension. But our analyses of effective teaching must recognize that outcomes for teachers as well as pupils must be considered in any adequate treatment of educational outcomes.”
is frequently viewed as an activity that students engage in privately and is seen as decoupled from other learning activities.

Questions We Are Pondering

- How do teachers determine what experiences best meet a student's needs? Which of the multiple learning opportunities available is best suited for a student's area for growth and learning style?
- How does one determine how best to leverage various modes of learning for specific learning goals (i.e. when and for what purpose to use each learning tool at a teacher's disposal)?
- How intentional are teachers expected to be in their choreography of students' experiences? What should a balanced diet of individual, small group and large group learning experiences look like?

PRIORITY AREA FOR GROWTH

Curating and Leveraging Rich Content for Learning

Historically, in traditional K-12 settings, teachers have selected and developed their own sets of content or implemented pre-selected curricula, with many teachers using the same sources for multiple years. Today, students have at their fingertips a seemingly limitless flow of sources. While personalized learning educators still select some content, the NAATE team saw students increasingly taking on this role. In this way, personalized learning schools are leading to a democratization of learning, whereby teachers are no longer the arbiters of the sources and quality of content. Students are now being asked to identify their own sources. This shift requires a new set of competencies for both teachers and students and also brings with it some potential cautions.

As historian Gertrude Himmelfarb has noted, “the democratization of the access to knowledge should not be confused with the democratization of knowledge itself... The internet is an equal opportunity resource; it recognizes no rank or status or privilege. In that democratic universe, all sources, all ideas, all theories seem equally valid and pertinent. It takes a discriminating mind, a mind that is already stocked with knowledge and trained in critical discernment, to distinguish between Peanuts and Shakespeare – between the trivial and important, the ephemeral and the enduring, the true and the false,” (1999, p. 615).

Teaching students how to identify and critically analyze sources for credibility and quality is a vital aspect of any type of schooling. However, the need to help students be discerning and discriminating in their selection of informational sources is particularly pronounced in personalized learning settings where there are fewer mechanisms by which adults serve as arbiters of what constitutes quality sources. Educators in these models now have the opportunity to cultivate students’ capacity to recognize, analyze, and construct new knowledge. With the disappearance of textbooks and scripted curriculum, and the move toward personalized pathways where students control what, when and how they learn, teachers need to ensure students possess discernment and analytical skills so that they can engage in rich learning experiences based on quality content.

The Field’s Perspective

It’s easy for schools caught up in these sweeping changes to lose sight of what will really push student learning forward: high-quality, challenging, rich content... Personalized learning will not help students if they are working with content that is below their capacity. Rigor and personalization need to go hand in hand... PL schools interested in supporting personalization through progressive teaching should ask themselves how they could use technology to support deeper, meaningful learning in ways that go beyond using tech for drill-and-skill learning.

~ NOTES FROM THE FIELD, CENTER ON REINVENTING PUBLIC EDUCATION
While information and sources are plentiful in technology-enabled learning settings, the conceptual frameworks necessary to gain real knowledge were not always as apparent to the team. Learning theory expert John Bransford asserts that students must have a rich factual knowledge base that lies in an awareness of the related conceptual frameworks (Bransford et al., 2000). For optimal outcomes, students should develop deep content understandings and be able to apply their learning to new contexts. For real learning to occur, students should be able to transfer their knowledge and not simply just recall it. Otherwise, student learning is piecemeal and develops unevenly, with holes and gaps (Khan, 2013; Staker & Horn, 2014). The potential danger then, is that, despite activity across a broad set of learning opportunities, students could emerge with a disjointed set of experiences that, together, do not provide them with a strong conceptual framework, putting knowledge acquisition and transfer at risk.

**Areas of Strength**

At the personalized learning schools the NAATE team observed, teachers were experimenting with ways to organize content and choreograph student learning experiences. One school network has built a platform that provides access to playlists that contain customized content for students at different levels. Content is curated by teachers and delivered to students based on their level. On this platform, students were working their way through content tailored to their individual needs.
through sets of tasks and checklists, completing assignments and assessments. As playlists are refined, they have the potential to offer teachers nationally a high-quality curricular resource with content for students at different levels of performance.

Areas of Opportunity
Because the team did not closely examine student products or source material, questions remain as to the level of rigor of the content students were exploring, as well as the quality of the learning activities in which they were engaged. It was unclear when and how students were being encouraged to cultivate the higher-order thinking skills and deeper understandings that schools are aiming to develop in their learners. If schools are personalizing pathways for students, schools should ensure that they are engaging students with rich content at their own level in ways that deepen their learning. More exploration is needed here to fully understand how and when schools are creating the space for students to engage in deeper levels of thinking and problem solving.

NAATE detects a significant opportunity to help teachers learn to be more intentional about how and when to engage students with challenging content such that students are able to make lasting meaning from it. Whether a shared book with a small or large group, or a primary text that serves as the basis for a Socratic Seminar, or a scientific experiment, or an independent project that addresses a student-identified societal problem, teachers have many vehicles for guiding students toward sources that are high-quality, and for co-constructing with students challenging and engaging learning experiences.

Helping teachers to be discerning and engage with rich content in different settings could help foster an appreciation for how to construct similar learning experiences for their students. Moreover, helping teachers to be more intentional about how to support students in being more discerning is key if schools are to cultivate literate, critical thinkers.

Questions We Are Pondering

- **How are teachers being supported to help students identify, select and evaluate sources of content and knowledge relevant to a specific content area?**
- **To what extent should students, rather than educators with domain expertise, be the arbiters of content and source selection?**
- **If content is crucial because it supports students’ “abilities to think and solve problems [that depend] on a rich body of knowledge about subject matter” (Bransford et al., p. 9), where and how is this deep content knowledge best fostered in personalized learning settings?**
- **If students need to acquire and understand new content but also discern and evaluate sources of content, how can personalized learning models equip teachers to support students to be intentional in how they acquire and apply content and transfer their knowledge?**
For students to be the drivers of their own learning, they need a rich set of metacognitive skills. Students must be able to self-regulate, plan, self-assess, modify and reflect on their own learning. These skills are foundational and central in a personalized learning environment. All personalized learning teacher competency frameworks focus heavily on teachers’ capacity to support students to manage their own learning, and yet to do so requires a deep level of knowledge about and understanding of key conceptual ideas such as self-regulation, goal-setting, agency & self-efficacy, and metacognitive self-reflection. Examples of related competencies include:

- Make sure students understand how to progress through content independently (TNTP).
- Understand and employ techniques for developing students’ skills of metacognition, self-regulation, and perseverance (JFF/CCSSO).
- Engage in deliberate practice and persevere toward ambitious, long-term educational and professional goals (NACOL).
- Discuss assessments with learners and guide them to identify a set of learning goals that are achievable, measurable and meaningful to them (LEAP).

Metacognition has been defined as, “awareness or knowledge of one’s own thinking.” (Zimmerman, 2002, p. 65), a definition that encompasses a wide range of competencies, including the capacity to engage in self-regulation, goal-setting, self-reflection, planning, modifying, assessing, and revising. Each of these capacities, in turn, has a corresponding set of specific skills that are required. Metacognition has been shown to play a critical role in student performance (Bransford et al., 1999). Metacognitive strategies can be taught even to very young children, enabling them to learn how to plan, manage their time, predict outcomes, activate background knowledge, and set goals. Getting students to manage their personalized learning pathways is an essential goal and central thesis of personalized learning. It is critical to teach students the skills that are preconditions for learning, particularly in settings where they are expected to take the reins of their own educational journey. Teachers must possess a deep understanding of the conceptual ideas that underpin the self-directed objectives of these school models.

The most fundamental distinction in personalized learning frameworks is that students, with the support of teachers, rather than teachers alone, are central in determining their own learning trajectory: students are directing their own learning. While all frameworks are in agreement that data and assessment are critical for student growth, the personalized learning frameworks assume that not only are teachers receiving and using data but they are also teaching students themselves how to analyze, synthesize and develop their own learning plans based on data. To teach students how to do this requires a more sophisticated understanding of student behaviors as well as data and assessment; rather than re-teaching a lesson based on class exit ticket results, now the teacher must develop student agency and metacognition. Students are expected to self-reflect and plan on their own in ways that address the feedback and accessible data.

In reviewing the frameworks, it is notable how much metacognitive work is expected of students. Students are required to employ metacognition, metacognitive knowledge (e.g. knowledge about how learning operates, and how to improve one’s learning), metacognitive monitoring (e.g. assessing how well one understands a concept she is studying, judging whether one is getting closer to a solution), and metacognitive control (e.g. deciding to use a new tactic to solve a difficult problem, spending more time trying to recall an answer) (Dunlosky and Mecalfe, 2009).
Research suggests that metacognitive work requires a level of content or domain knowledge: “It is very hard to have adequate metacognitive knowledge of one’s competencies in a domain without substantial (cognitive) domain-specific knowledge, such as knowledge about relevant concepts and theories in a domain, about intrinsic difficulties of a domain, and about what is irrelevant. In terms of metacognitive skills, one cannot engage in planning without carrying out cognitive activities, such as generating problem-solving steps and sequencing those steps. Similarly, one cannot check one’s outcome of a calculation without comparing the outcome with an estimation of it, or recalculating the outcome in another way” (Veenman, Van Hout-Wolters & Afflerbach, 2006). In other words, developing metacognition requires an individual to have domain-specific knowledge, enough to be able to reflect on and make meaning of one’s work. This raises a pair of related questions: 1) what are the right supports to develop in students the domain-specific metacognitive skills necessary to be able to accurately assess their own learning?, and 2) what competencies, skills and strategies do teachers need to possess in order to guide students to do this?

PRIORITY AREA FOR GROWTH

Student Goal-Setting

The aspect of metacognition that is most immediately visible and most frequently cited in personalized learning schools is that of regular goal-setting on the part of students. Goal-setting has been shown to, “help students learn to take control of their own learning by defining learning goals and monitoring their progress in achieving them,” (Bransford, 2000, p. 19). Research has demonstrated that, “students who set specific and proximal goals for themselves displayed superior achievement and perceptions of personal efficacy,” (Zimmerman, 2002, p. 65).

On its face, goal-setting is a simple task: an individual identifies what he or she needs to work on to improve, and sets specific, measurable goals. However, motivation science and education research reveal a much more nuanced process, one that is interrelated to other categories of metacognition, including self-efficacy, planning, content, and motivation (Berger, 2014; Shaw & Gardner eds., 2008). Motivation lies at the heart of goal-setting: “[M]otivation has been recognized as the organizing and energizing force behind all actions,” (Shah & Gartner eds., 2008, p. 405). According to psychology professor Carol Dweck, who has popularized the positive relationship of mindset to academic and social outcomes, “self-theories and goals together create a system of meaning that shapes... how people understand their own experience, and guiding their affect, cognition and behavior,” (Shah & Gartner eds., 2008, p. 405). Students’ self-theories determine the types of goals that they pursue and these goals have a powerful effect on their academic path and outcomes (Dweck, 2008; Bandura, 1994).

Ron Berger, Chief Program Officer of Expeditionary Learning, describes goal-setting as a “learning target” and notes that, “the term target is significant. It emphasizes that students are aiming for something specific. Every day, students discuss, reflect, track their progress, and assess their work in relation to learning targets. Learning targets build investment in learning by giving students the language to discuss what they know and what they need to learn,” (Berger, 2014). Unfortunately, Berger notes, teachers frequently, “fall into the trap of simply saying ‘try harder’ without giving students specific targets,” and helping them develop and work towards that goal (2014). And if, as some contend, new models of schools should, “start with learning goals that are broad, deep, and interdisciplinary across academic, cognitive, and social-emotional aims,” (Childress et al., 2015), then educators need to be steeped in an understanding of the concepts necessary to help students set and meet these goals.

Goal-setting in the abstract is not necessarily a universally effective instructional tool. According to the research, goal-setting must be discipline specific: “The teaching of metacognitive activities must be incorporated into the subject matter that students are learning. These strategies are not generic across subjects, and attempts to teach them as generic can lead to failure to transfer,” (Bransford et al., 2000, p. 19). Berger also suggests that, “to be effective, goals should be specific
and doable (challenging enough to advance learning but not so challenging as to overwhelm or frustrate)...[and be] written in student friendly language,” (Berger, 2014).

**Strengths We Observed**

At nearly all of the schools that the NAATE team visited, there was an explicit and ongoing focus on goal-setting: students were engaged in goal-setting activities either daily or several times per week. In nearly all of the settings that the team observed, students were recording their goals and seemed to have internalized this practice as part of their daily work. Teachers across the K-12 spectrum had students set goals using a variety of tools, whereby students had to fill in goals for a particular set of time or given unit, or track their progress against a set of benchmarks contained within their personalized playlists.

Much time and attention was devoted to students managing their own goal-setting. Every teacher observed alluded to students’ goals over the course of a lesson, and instructed them to check their progress against their own learning plan. Learning goals were made visible to students on the platforms they were utilizing in ways that were, for the most part, visual and student-friendly.

**Areas of Opportunity**

Given the commitment to and focus on goal-setting, the NAATE team saw a significant opportunity to deepen the way educators support students to set learning targets for themselves. Teachers can become better equipped with language, concepts, and processes to help student develop a more nuanced understanding of goal-setting and self-management. Moreover, the NAATE team's observations suggested that goal-setting could be better rooted in the content, skills and personal attributes students are working to develop. In speaking with students about their goals, the NAATE team did not typically observe the level of self-awareness described by the researchers as being important (as synthesized above). While goal-setting was ubiquitous, the team had questions about the quality and utility of the goal-setting; about whether these goals led to increased student motivation and perseverance; and about whether the goals were specific enough to drive deep learning and mastery. Students seemed more focused on the outputs or productivity of their efforts (e.g. “I will write a 5-paragraph essay by Thursday,”) than on the specific skills or knowledge they were striving to develop (e.g. “I
am working to improve my inference skills as I read my next book, and will do so by asking myself this set of questions as I read.”).

Typically, goals seemed to remain somewhat general rather than tailored to subject matter specifics or social-emotional growth. How well students internalized these goals and the impact of goal-setting on student learning remains a question.

Because of the existing dedication to goal-setting, there is an opportunity to help teachers more fully develop the knowledge, the conceptual understanding and language, and the dispositions necessary to support students so that they themselves can craft personal, specific and purposeful goals. Some of this work is related to building the social and emotional competence of teachers. However, much of it lies in providing specific approaches teachers can use to equip students to identify precisely where they are in their development, where they are striving to get to, how they will get there, what obstacles they might anticipate, and how they will approach and overcome these obstacles. The well-established body of research on metacognition suggests a clear set of practices that teachers can use in their work with students.

Questions We Are Pondering

- How can schools transform the goal-setting process from one that is very quantitative, and output-driven to one that fosters students’ greater self-awareness and motivation?
- What kind of coaching is necessary for students to be better equipped to articulate their own performance, area for improvement, and pathway toward meeting their goals?
- When and how is individual goal-setting happening? How should time for this work be built into the day?
- To what extent are schools encouraging goal-setting to be content specific (rather than general) and integrating successes and failures into the ongoing assessment and development of individual students?

Developing Approaches to High-Quality Student Feedback

Precise and specific feedback is an important aspect of academic growth and a necessary part of the goal-setting loop. For students to develop skills and knowledge at their own pace and in their own way, they must have a clear understanding of what they are working toward. Education researcher K. Anders Ericsson explains that “deliberate practice” includes the active monitoring of one’s learning experiences (1993). The research base also demonstrates that this “monitoring” relies on, “attempts to seek and use feedback about one’s progress,” (Bransford et al., p. 59). It is widely agreed that feedback is essential for successful learning, and that students need feedback about, “when, where, and how to use the knowledge they are learning,” (Bransford et al., p. 49). The personalized learning schools NAATE studied are committing time to goal-setting and data analysis, and yet it was unclear how much specific teacher feedback students are receiving on their skills and knowledge, and how embedded feedback is in the process of setting and accomplishing goals.

As self-efficacy theorist, Albert Bandura, notes, “successful efficacy builders do more than convey positive appraisals. In addition to raising people’s beliefs in their capabilities, [efficacy builders] structure situations for them in ways that bring success and avoid placing people in situations prematurely where they are likely to fail often,” (1994, p. 3). The implications for teachers include the importance of ensuring that they structure learning pathways in ways that foster students’ sense of efficacy; feedback is one key tool in doing this. Ideally, teachers in personalized learning are doing what Bandura calls for: measuring success in terms of self-improvement rather than by triumphs over others (Bandura, 1994). David Scott Yeager and his colleagues conducted research that demonstrated the importance of building trust as the prerequisite for building relationships and providing feedback to students: it is trust that determines to what extent
feedback will be received and enacted by students in their practice (Yeager et al, 2013). Yeager and his team’s findings on the importance of “wise interventions” in cultivating trust when providing feedback across the racial divide is extremely relevant for personalized learning schools in particular.

**Areas of Strength**

In most classrooms the NAATE team observed, teachers were working toward having students self-diagnose and identify areas for improvement in their work. They were encouraging students to reflect on what they could improve upon. In nearly all classes, the team observed teachers dispensing encouragement and praise to students during various learning activities.

**Areas of Opportunity**

The NAATE team saw an opportunity to develop teachers so that they dispense praise in ways that are commensurate with demonstrated best practices (Yeager et al., 2013; Willingham, 2005). Research has shown that praise can have an unintended negative impact on the way students perceive the feedback they receive. University of Virginia psychologist David Willingham has suggested that praise is best delivered as an “honest expression meant to congratulate the student,” (2005). In some cases, praise can have a detrimental effect if it is instead used to control, is dishonest, unearned, emphasizes ability, or is insincere (Willingham, 2005).

Feedback relies on the relationship between teacher and student, making students’ psychological safety and the extent to which they feel understood critical factors in students’ receptivity to that feedback. Thus, any efforts on the part of personalized learning schools to provide students with tailored feedback on performance should reflect a nuanced appreciation for how to deliver feedback so that it has the desired effect on student performance. The NAATE team identified an opportunity to build teachers’ understanding of how to leverage trust and openness with students to provide constructive feedback that leads to students’ capacity to self-manage. With the burgeoning research base that has emerged over the past decade on resiliency, trauma, and cognitive psychology, there is much for educators to learn about how to ensure that their feedback is serving to motivate, engage, and build students’ sense of efficacy.

On a related but separate note, given the amount of time students are engaged in paired and small group discussions, there seems to be a significant opportunity to help teachers better structure peer feedback in this effort. Many classrooms are using peer feedback as a tool, though not all students have developed the language and content knowledge in classrooms to be able to provide powerful feedback.

As Ron Berger displays in “Austin and the Butterfly,” a video of early elementary school students providing peer feedback used as part of the training of teachers at High Tech High and elsewhere, peer feedback can be a profoundly powerful tool to improve student practice and cultivate student agency. And yet, Berger writes, “Peer-to-peer feedback is effective only when students are given a clear focus toward a particular aspect of the work, often based on a strong model, and the skill and background to analyze it effectively,” (Expeditionary Learning, 2012, p.5). Given the attention in personalized learning to feedback and revision, peer feedback holds promise to be a powerful tool in student improvement if teachers are able to equip students through modeling and support.

**Questions We Are Pondering**

- What role do personalized learning schools see teachers playing in providing students with expert feedback?
- How intentional are schools in developing student and teacher language to describe performance within specific content areas?
- Given the educational psychology and socio-emotional underpinnings associated with giving and receiving feedback, to what extent are teachers being exposed to the research to understand how to create the optimal conditions for students to receive and incorporate feedback?
Traditionally, teacher frameworks devote significant time to classroom management in settings with an individual teacher managing a set group of students for a specified time. Accordingly, there has been great emphasis placed on developing procedures, organizing physical space, and responding to behaviors of groups of students. In contrast, the personalized learning competency frameworks shift the focus to the ways in which teachers manage flexible groupings that vary frequently, and the extent to which they are student centered. Because the learning environment is no longer bound by structured blocks of time in set places with batch-sorted students, teachers must be accountable for equipping students to take ownership for their learning and manage their own progress in a broader simultaneous array of structures. It is the teachers who are cultivating students’ capacity to work independently and collaboratively, which requires strong teacher-student relationships as well as a deep belief in each student’s potential.

A precondition for students’ ownership of their learning is their sense of safety and support. Students must also believe that they have the capacity to succeed, find ways to remain motivated and engaged, and self-regulate over the course of their learning journey. Given the centrality of student ownership in personalized learning models, educators in these settings must be even more attuned to the psycho-social needs of students so that they can support students to be successful. This demand is even more acute at the secondary level when students frequently arrive at personalized learning schools without having experienced a similar level of autonomy and responsibility for their own learning.

The famous “Marshmallow Test,” conducted in the 1960s and 1970s, measured young children’s capacity to delay gratification for future benefits. The test subjects were followed in subsequent years, and the test proved to be a strong predictor of test subjects’ lifelong health and success along a host of metrics, including SAT scores, educational attainment, body mass index, and other measures (Mischel, 2014). Knowing how to regulate oneself and devise strategies to resist non-productive behavior is critical to achievement, and learning specific strategies for doing so are critical. Much of the recent focus on “grit” and “perseverance” aims to foster such strategies. Yet, as many schools can attest, the work of creating self-motivated, self-regulated young people is challenging and requires significant investment on the part of adults guiding them. Personalized learning schools must therefore attend to teachers’ own social-emotional competency so that they can support their students.

Cognitive psychology, child development, and other fields have demonstrated the centrality of social-emotional health in the academic life of students. In recent years, schools have adopted a range of programs and curricula aimed at building the social-emotional competency of students. Some have focused on structuring times during the school week dedicated to cultivating students’ social and emotional competence. And yet there has been less attention paid to the development of teachers’ own social and emotional competence, even as research has revealed the role that teacher mindsets, perceptions, beliefs, and implicit biases play in student performance. Given the new set of roles teachers are playing in personalized learning schools (coach, motivator, mentor, guide, advisor), it is critical that these schools invest significantly in building the social-emotional competence of teachers themselves. To develop students to be socially and emotionally adept, teachers themselves need to be developed. Teachers’ confidence and skills in their non-academic roles in personalized learning schools will directly influence their ability to motivate, develop, and support students to be successful (Jennings & Greenberg, 2008). All personalized learning frameworks identify social and emotional competencies on the part of teachers and view them as significant. Examples of related competencies include:

- Design, strengthen, and participate in positive learning environments (i.e. school and classroom
culture) that support individual and collaborative learning (JFF/CCSSO).

- Openly and frequently share successes, failures, and challenges (iNACOL).
- Set expectations and support for the development of “team” skills (e.g., negotiation, conflict resolution, and assertion) (LEAP).

The full list of competencies for social and emotional learning describe a highly skilled, humanistic educator who has the capacity to address students’ psychological, social, and emotional needs at levels beyond what is necessary in a more traditional setting, given the more personalized relationships (see also CASEL SEL Guide, B. Stafford-Brizard’s Building Blocks for Learning, and Valor Collegiate’s Compass Framework for more complete frameworks of social-emotional learning).

**PRIORITY AREA FOR GROWTH**

**Enhancing Teacher Competency in Building Student Relationships**

Personalization requires that teachers know their students as individuals and that they are attuned to students’ individual needs, arguably to a greater degree than in other settings. This is particularly true when students at the secondary level arrive at personalized learning schools without having previously experienced a similar level of autonomy and responsibility for their own learning. All personalized learning frameworks identify social and emotional competencies on the part of teachers, and few schools have designed or articulated an approach to cultivating the “soft skills” teachers in these settings so crucially need to be successful. In classroom observations, the team saw the importance of teachers’ capacity to motivate, encourage, and challenge students to persevere in their learning. The difference in how adept teachers and struggling teachers react to students who are “off-task” was visible. What became apparent was that the teachers who understood their students and had a set of strategies for supporting them were more successful in handling such situations than those who did not. Teachers without these skills reverted to more technical approaches to students, using strategies more commonly found in more traditional schools, such as providing warnings, demerits, or other consequences. Teachers who exhibited more social-emotional competence with students tended to seek to understand the reason for the behavior, and to serve as a partner with students to come up with solutions. In a number of instances, the NAATE team sensed that behavioral issues arose either from students’ struggle with individual work, or from what the team perceived as boredom (which most frequently occurred during blended learning time, based on the team’s observations).

Personalized learning schools are designed to increase student engagement. Educational research has identified several types of student engagement, including emotional, behavioral and cognitive engagement that are central to student success. Robert Marzano and Debra Pickering, co-authors of The Highly Engaged Classroom, identify four elements that are typical in any discussion of engagement: emotions, interest, perceived importance, and perceptions of efficacy (2011). In an engaged classroom, students and teachers might be expected to exhibit any of the following emotions: enthusiasm, choice, interest, enjoyment, satisfaction, pride, vitality, and zest (Marzano & Pickering, 2011). These affective responses lead to positive student-teacher relationships and improved student outcomes. In classrooms where teachers are not as connected to students, positive associations with learning are diminished. Schools stand to benefit from a focused and deliberative effort in cultivating teachers’ social and emotional competence, so that teachers are able to forge strong teacher-student relationships.

Much research has been conducted on key factors that can foster productive relationships between teachers and students. As previously noted, one group of researchers found that trust is a crucial component for cultivating students’ self-efficacy and is key in students’ acceptance and response to critical feedback: “Trust permits people to disambiguate feedback and to see criticism as information that can help them improve rather than as a possible evidence of bias,” (Yeager, D.S. et al., 2013). For students to be able to receive and act on feedback, trusting relationships must be forged. The professional learning in most of the schools the team observed centered on the academic and technical aspects of
personalized learning, and attended less to the social and emotional elements that are so critical to student success.

One network that has received national attention for its school model (which does not explicitly personalize academics) is centered on social-emotional learning and serves as a proof point for the power of social-emotional learning to drive academic success. The network is unique in that it employs structures for both the adults and the students, modeling for teachers what they are expected to implement themselves with students. The model is based on principles of psychoanalysis and reflects a belief that, in order to move students toward social-emotional competence, teachers themselves must engage in social-emotional learning. Teachers, rather than merely executing strategies or curricula with students, are required to address their own social and emotional needs alongside their peers, making themselves vulnerable in the process. In this way, the school has cultivated in its staff an appreciation for the profound and sometimes difficult work that students must engage in. No other schools included in the study attend to the development of adults’ social-emotional learning so intentionally or intensively. Yet the team felt that all personalized learning schools stand to benefit enormously from investing in the development of teachers’ social and emotional competence. Only by doing so will schools prepare teachers to fully personalize instruction and develop independent learners: teachers need to think as much about students’ motivations, emotions, and psychological needs as they do about their academic abilities in order for students to flourish. Through investment in social-emotional learning, teachers will be better able to navigate their relationships with students and facilitate students’ interactions and relationships with one another, central elements of personalized learning models.

**Areas of Strength**

All of the schools that the NAATE team visited have employed structures meant to cultivate teacher-student relationships, including mentoring groups, advisory, and other structures. In addition, the team observed that teachers are employing social-emotional learning lan-

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**An Illustration from the Team’s Field Work**

In one ninth-grade history classroom, the teacher utilized leveled readings for high school students, with a piece rewritten for different levels of reading (grades 5-8, 9-10, 11-12). Students were asked to collect the appropriate reading for themselves. It was evident from students’ reactions that there was no shame attached to selecting a lower-level text. In contrast, in another classroom, a young man failed to complete an assignment the teacher had given him on his playlist. When she discovered this and asked him to complete it multiple times, he became defensive and, finally, admitted that he did not know how to complete the activity. While the exchange revealed a gap in the teacher’s understanding of the student’s knowledge and skills in the particular subject area, it also revealed the gulf that existed between the teacher and the student from a social-emotional standpoint. Rather than coming forward to share his confusion or need for support, the student had withdrawn from the individual work time in class. We left feeling as if the teacher would benefit not only from learning ways to check for understanding, but also in how to cultivate supportive relationships that allow for students to be vulnerable and seek out help as they need it. Without this competency, students like the one described here may withdraw and disengage from their learning.

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Language in classrooms, frequently naming the behaviors they see and providing students with feedback on the ways they interact with their peers. The team saw different strategies used (including elements of Responsive Classrooms, Teach Like a Champion, and other models), most of which focused on the tools, tactics and strategies necessary for self-regulation. The team also saw teachers employing language that drew directly from the growth-mindset literature for the purpose of motivat-
Areas of Opportunity

While a wide array of resources has been dedicated to teachers’ professional learning in the use of online platforms, data analysis, and other academic elements of teaching in personalized learning settings, it appears that many schools are still working to find ways to develop the social-emotional competency of educators. As stated earlier, the development of teachers seems to be focused more on the transactional elements of social-emotional learning, such as the structure of advisories or the curricula teachers are using with students, and less about adults’ personal capacity to forge and navigate relationships with their students and each other. There is a significant opportunity to develop in teachers a foundational understanding of the conceptual underpinnings of social-emotional development. The NAATE team sees an opportunity to help teachers understand the role trust plays in cultivating student motivation, how affirming students’ values affects academic performance, how stereotype threat undermines student motivation, the role teachers play in creating the conditions for students to accept and overcome failure, and a host of other core aspects of social-emotional competence.

Questions We Are Pondering

- To what extent are schools explicitly accounting for the development of adult social-emotional competencies as they enter their work with students?
- To what extent are schools modeling and doing the prework with adults that they then want them to engage in with students?
- How are teachers expected to learn the foundational building blocks of social-emotional learning?
- How are schools leveraging the burgeoning research in the fields of cognitive psychology and child development to promote their goals for student agency and long-term success?
- What supports are being put in place to ensure that teachers are supported as they work to build relationships with students?

PRIORITY AREA FOR GROWTH

Strategies for Cultivating Student Agency

While it is important for teachers in all types of schools to build student agency, the importance of doing so is magnified in personalized learning settings, as students are working on their own learning pathways toward mastery. In personalized learning schools, it is incumbent on teachers to provide students with feedback that helps students continue to work toward and achieve their goals independently.

Education research reveals that habits such as motivation, agency, and perseverance are central to students’ academic success: “Unless students can find reason and inspiration to care about learning and have hope that they can improve, excellence and high achievement will remain the domain of a select group,” (Berger et al., 2014). Researchers have pointed to, “perseverance, grit and self-discipline as especially strong indicators of academic success,” (Dweck et al., 2011; Duckworth & Seligman, 2005). These qualities, “affect the amount of time that people are willing to devote to learning. Humans are motivated to develop competence and to solve problems; they have... competence motivation,” (Bransford et al., p. 61). If all students in personalized learning models are to succeed, it is imperative that teachers know how to encourage and motivate them toward academic excellence and social-emotional development.

Student agency is premised on a belief that students are more engaged when they take ownership of their own learning and this process has been linked to improved student outcomes. With agency, students are, “compelled and supported to understand themselves as learners and advocate for themselves...[and this] can be a foundation of college and career success,” (Berger et al,
2014; Staker & Horn, 2015). Student agency must be fostered by the school’s community and culture to be effective, and is driven in large part by students’ internalized understanding of where they are, where they need to get to, and how they are going to get there. Quality feedback, discussed earlier in this report, is central to cultivating student capacity to self-assess, self-monitor, and self-motivate, and is thus a vital component of personalized learning schools.

Areas of Strength

Personalized learning schools all explicitly emphasize the importance of student motivation and perseverance in learning. The one tool the team saw consistently being used was oral feedback during class time. Across all schools, the team saw teachers dispensing short-cycle feedback publicly to students on their academic performance during class, mentoring periods, or other times. In some cases, the team saw teachers reviewing students’ performance across multiple subjects or conducting a general check-in with students. The team observed many teachers providing positive feedback and encouragement to students which they later explained was meant to foster student motivation.

Areas of Opportunity

In classrooms, much of teacher feedback focused on completion of tasks or student effort. Except for one classroom, the team did not hear teachers routinely provide targeted, domain-specific feedback to advance student understanding or skill, nor explicit discussion of specific strategies students might use to improve. Teachers often provided strong verbal praise, such as “great job” or “good work,” but very little feedback for students to leverage specific strategies towards their academic advancement.

Teachers were regularly observed providing praise on students’ social and emotional progress, adopting language from the traditional educational lexicon within their classrooms to encourage students’ accomplishments (e.g. “kiss your brain,” “you can do it,” “Joachim seems to be having trouble focusing,” “great job, you’ve got it,” “I see Jose is ready,”). While the praise was dispensed to encourage students, research suggests that such praise can, in fact, be counter-productive under certain conditions. As Daniel Willingham, a Professor of Psychology at the University of Virginia, points out, “collectively, [studies] show that whether or not praise is beneficial depends on when and how it is used. Praise is a complex phenomenon, but a relatively clear picture has emerged that provides guidelines as to when and why praise will—and will not—be beneficial,” (Willingham, 2006). Thus, knowing when, under what circumstances, and how to give praise to students is crucial in settings where there is short-cycle student performance feedback. Understanding and acting in accordance with what is known to be effective would benefit educators tremendously in these settings if they are to help guide students to exercise the agency required for self-directed learning.

Several school leaders recognized the need to better integrate academic experiences with social-emotional learning experiences. They saw an opportunity to strengthen non-academic learning opportunities (e.g. mentoring, advisory, leadership classes). At the same time, teachers held a range of perspectives on their roles in non-academic activities. Some shared that their teaching has been transformed because they saw their roles as supporting students’ development in habits of mind rather than just content, and saw a dramatic difference in their students’ performance. Others reported feeling that the social-emotional learning focused time in the day was disconnected from academics and detracted from student performance, as it was not productive time. The team saw an opportunity for schools to work with teachers to improve the way they use the time they are given during the school day to develop the habit, beliefs, mindsets, and skills students need, both in the classroom and during other dedicated portions of their day.

Questions We Are Pondering

- If short-cycle feedback is central to personalized learning models, how can schools leverage the rich body of relevant research to foster teachers’ understanding of how to provide feedback in productive ways that yield changes in student performance and social-emotional outlook?
If a major role of teachers is to help students to persist and overcome challenges on their learning pathway, to what extent should such strategies be explicitly taught?

How are schools ensuring that teachers have the support necessary to make the most of non-academic time with students so that students cultivate the social-emotional competencies they need to become self-directed learners?

**Domain 4: Data & Assessment**

This domain remains an active strand of NAATE’s ongoing research. The comments below are preliminary reflections and observations. The findings here are based predominantly on classroom observations and teacher interviews and will be expanded upon in subsequent reporting through a more thorough study of data systems, protocols, and supports for teachers. The promise of personalized learning lies in the opportunity for students to engage in a learning pathway that is customized, based on his or her strengths, areas for development, interests, and learning modalities. Personalized learning schools are generating an enormous array of data from a range of sources. Ideally, access to such data enables teachers to develop a sophisticated understanding of students. By doing so, teachers are able to regularly analyze, prioritize, and leverage data from multiple sources easily in order to be responsive to students’ needs. Data analysis skills are cited in all personalized learning frameworks. Examples of related competencies include:

- Develop a keen ability to identify the data that will provide the most actionable evidence; accurately analyze student data to identify trends and learning gaps; capitalize on online tools that deliver data points in real time (TNTP).
- Use assessment and data as tools for learning (JFF/CCSSO).

Look objectively at all results (both positive and negative), and help others to do the same (iNACOL).

Provide learners with ongoing access to their performance data to help identify academic needs; provide support and guidance to build learners’ assessment literacy and skills (LEAP).

Over the past decade, “data-driven instruction” has become a central tool in improving student outcomes. Research has demonstrated the power that data-driven instruction can have on student improvement gains (Bambrick-Santoyo, 2010; Berger et al., 2014). In personalized learning schools, data plays a similarly central role in the assessment of student progress and is viewed as a vital aspect of teacher practice. Ostensibly, with access to more regular real-time data, teachers are better equipped to support each student’s journey toward mastery. Yet challenges exist in utilizing data in precise ways to help students develop the specific skills and knowledge they need to master the standards that they are working toward.
Coordination and Streamlining of Teacher Access to Student Data

Personalized learning models are premised on the value of data-driven decision-making, based on a range of data on the part of the teacher as well as the student. Yet, as the team discovered, data are not being synthesized in ways that enable teachers to design and optimize responsive personalized learning experiences. Leaders of school networks are keenly aware of the challenges teachers face as they receive data from numerous disparate sources. Some have adopted strategies to mitigate the challenges for teachers (e.g., one network created a position dedicated to aggregating data into a dashboard) while others await the day when such data will be streamlined on a single dashboard.

Areas of Strength

Nearly all schools are investing in platforms that allow students to view performance data. As in more traditional schools, professional development time is set aside for “data days” in many models, and teachers are supported in developing data analysis systems and skills. Students themselves are aware of their progress toward their goals, though their depth of understanding varies (from recognizing they are “behind” or needing to “catch up,” to a more nuanced understanding of what they need to work on specifically).

Areas of Opportunity

During teacher interviews, the team repeatedly heard concerns about the sheer amount of data that is being generated. Some teachers spoke about the number of spreadsheets they receive on various aspects of student performance. Others shared they did not have the capacity or time to analyze data on all their students. Many confessed feeling as if there was insufficient connection between the work students did on blended learning platforms and their classroom instruction. A few felt that the data being generated by online platforms was not useful. Some teachers also expressed concerns that students were likely not fully engaged during unsupervised time, and that data generated from these platforms may therefore be unreliable.

Blended learning platforms, used in all school models the NAATE team visited, generate abundant student achievement data. Data are being generated through competency testing, standardized testing, and formative assessments. Teachers also have access to data such as student behavior and course pass rates. Teachers and students can typically access data depicting students’ progress toward mastery objectives. At schools utilizing some model of a learning lab or non-class-embedded time, as well as in classrooms where students are on blended learning platforms, the NAATE team noticed a potential disconnect: platform-derived student performance data existed separately from data gathered from other sources. Integrating these data streams seems to be a significant opportunity, and one that schools recognize.

Even as data systems increasingly become integrated and more teacher-friendly in nature, personalized learning educators would benefit from more clearly defined expectations on how teachers should use, integrate and make decisions based on the data that is generated across the range of platforms and learning experiences. Given the premise of personalized learning, which is meeting students where they are in their development, helping teachers to view, interpret, prioritize and act on the various data at their disposal should be a central priority.

Questions We Are Pondering

- How should data being generated by blended learning platforms be used by teachers of core content areas? What are the expectations of teachers to be responsive to the needs of students as measured by these platforms?
- What guidance do teachers receive in prioritizing and integrating the data schools are generating? Are all the data equal in value to schools, teachers and students?
Leveraging Data to Personalize Learning for Students

Assuming that over time teachers are better able to access streamlined data documenting students’ performance, the need remains to equip teachers to craft very specific recommendations to students based on this assessment data. This skill is acutely important in personalized learning models because each recommendation is tailored to the needs and capabilities of each individual student.

Each student in a personalized learning school is at a different point along a customized personalized learning trajectory. Teachers are expected to have a more granular understanding of how to support students along a wider spectrum of ability levels. As one school leader summarized, “in traditional settings, teachers might be expected to plan for lessons that address kids across three or four grade levels, even if students are actually performing on a wider range of levels. In a personalized learning setting like ours, especially at the secondary level, the expectation is that teachers are serving each individual student, even when kids are literally performing between a third grade- and freshman college-level.” For teachers, this means they must be highly equipped to craft a wide range of instructional responses, including designing individualized learning assignments and daily responses and interventions for each and every student. Facility with data and the capacity to make pedagogical decisions based on multiple sources of data is crucial for teachers in these settings.

Areas of Strength

Throughout the team’s visits, the team saw students conferencing with teachers about their progress. Teachers appeared invested in helping students to work along their personal learning pathways. Students shared with teachers their progress toward completion on playlists or on a set of standards they were working to achieve. Overall, teachers were using data to assign students readings, assignments, and assessments, though usually the data they used was from student performance in their own individual course, and less from learning activities outside of their own course (i.e. other subjects or the blended learning platforms).

Areas of Opportunity

Drawing the connection between personalization of instruction and analysis of data presumes a level of pedagogical content knowledge on the part of teachers that allows them to actively and intentionally make decisions based on the very specific needs of each student. Ideally, teachers determine the best vehicle(s) for mastering a particular skill or set of content, deciding among one-on-one instruction, a group project, peer tutoring, small group discussion or time on an adaptive technology platform. It is unclear whether teachers have internalized a set of guidelines on how best to match learning experiences to students based on an integrated look at their specific learning profiles and performance data. Moreover, without a deep understanding and level of expertise in one’s subject area, teachers are limited in their ability to craft highly individualized responses to the data they analyze. To this end, the capacity to use data to personalize instruction is inextricably linked to teachers’ pedagogical content knowledge and subject area expertise.

The Field’s Perspective

“Educators face complex circumstances, like what to do when a child is struggling or how best to engage and motivates students. Research is critical in arming educators with useful information about how best to serve each student.”

~ A BLUEPRINT FOR BREAKTHROUGHS: FEDERALLY FUNDED EDUCATION RESEARCH IN 2016 AND BEYOND BY MICHAEL B. HORN AND JULIA FREELAND FISHER, CLAYTON CHRISTENSEN INSTITUTE FOR DISRUPTIVE INNOVATION
This domain remains an active strand of NAATE’s ongoing research. The comments below are preliminary reflections and observations. While NAATE identified needs that are highly specific to personalized learning schools, the team’s observations suggest that there is a set of foundational needs related to teachers’ work with adults (e.g. peer feedback, leadership, teaming, organizational effectiveness) that they share with their colleagues in other school models.

The term “teacher leadership” has become popularized in recent years and is used to describe a plethora of roles teachers play in schools. Yet the roles teachers are playing in personalized schools seem somewhat unique, as teachers are experimenting, iterating, and creating dramatically different models of schooling, and are also playing a central role in facilitating their peers’ professional development on novel and emerging practices.

Personalized learning schools all describe teachers as playing an expanded set of roles with their peers, even as teachers in these settings are typically relatively young and new to the profession. Teachers with just a few years of experience are being charged with onboarding and supporting new teachers. While this is not unique to personalized learning schools, it is unique in that teachers are doing so even as school models and approaches to teaching and learning are being piloted, developed, and iterated upon. As one network leader noted, they are doing so even as they themselves lack mental models of what good personalized learning looks like.

The adaptive and iterative nature of personalized learning schools is unique and has implications for teachers: teachers must embrace a flexible mindset. The structures and solidified approaches to teacher collaboration that exist in traditional schools are no longer applicable given the level of adaptation, rate of change and evolving school structures. While a seventh grade team in a traditional school might co-design a unit and discuss results of a common assessment, in most personalized learning schools the NAATE team visited, teachers described more fluid ways of meeting and did not necessarily co-plan. The NAATE team observed that there remains an opportunity for professional exchange and support that would provide teachers with a more intentional and structured approach to strengthening their practice.

### PRIORITY AREA FOR GROWTH

#### Facilitating Adult Learning

Professional development is a ubiquitous activity in the world of K-12 education and remains a central component in personalized learning models. Teachers are at the front line of education reform and are consistently asked to, “include changes in curriculum that require more authentic activities and assessments; integrate state standards into the curricula; prepare students for standardized assessments; and include other innovations,” (Gregson & Sturko, 2007). In innovative personalized learning models, teachers are being asked to iterate on learning models and provide feedback to network-level leaders on ways to improve them. Additionally, schools working toward ambitious and bold visions for learning are relying on teachers to participate in the design process itself. Teachers are asked to lead professional development for peers, and are even leading sessions for teachers from across the nation who are adopting their methods. In most cases, relatively new teachers are expected to provide support to even newer teachers.

There is much interest in finding ways to personalize professional learning for teachers (Breztmann, 2015). Some investment has been made in platforms for professional development for teachers that allow for some level of customization of learning—both by national entities and school networks themselves. Yet teachers shared that online platforms in their current
form feel disconnected from their daily experience and serve more as a repository of resources or set of assigned learning experiences than a coherent personalized learning pathway. School network leaders acknowledged this and shared that they hoped to one day be able to offer teachers personalized learning that allows schools to match professional learning to each teacher’s needs, offer them support and follow up, and evaluate their learning experience, which are all critical components of effective professional development according to such experts as Thomas Guskey. While personalized learning for teachers may still be early in its infancy, there are many opportunities to create high-quality adult learning experiences that lead to changes in practice through job-embedded professional development, if the proper conditions are preset to do so.

Ideally, professional development experiences should be rooted in the principles of andragogy. Malcolm Knowles devised a theoretical framework for adult learning asserting that a learner’s experience should be shaped by his or her individuality as a learner, based on one’s self-concept, experience, readiness to learn, orientation to learning, and motivation to learn. Knowles believed strongly in the importance of communicating respect for adult learners and that the learning should be practical and relevant. As an adult learner matures and gains experience, his or her needs evolve, and so should one’s learning experiences. In some ways, andragogy shares some commonalities with the kind of learning personalized learning models aspire to, with learners’ need for structure, scaffolds, tools and tactics lessening as they are able to take on an increased responsibility for their learning and are able to generalize their learning.

**Areas of Strength**

All of the schools that the NAATE team visited recognize the importance of teacher development. They have built models of professional development, invested in onboarding new teachers through in-house programming, and have begun thinking about how to develop coaching – one network provides each and every teacher with a coach (either an instructional coach or school administrator). Several schools are using Relay Education, a model of teacher development that was designed for schools predicated on different tenets and assumptions about learning and instructional methods. Other schools are leading their own professional development, and networks are carving out time for network-wide professional development where practitioners are sharing learning across schools. In most cases, professional development is being led by administrators and teachers and focuses on sharing best practices. The professional development observed looked similar to other non-personalized learning school settings, in spite of the differences in school models.

Most schools recognized the need, ultimately, to personalize professional learning. Several organizations are organizing their professional development so that it is teacher-led and self-selected by participants. The underlying belief is that teachers should have choice about where and how to strengthen their practice, and that teachers learn best from their peers rather than from a top-down mandated delivery approach.

**Areas of Opportunity**

There exists a rich opportunity to help schools design more intentional approaches to professional learning. The work of the teacher in personalized learning settings is more nuanced and varied than in traditional learning environments. It requires teachers to be vulnerable, empathic, and relational, and necessitates a set of skills that most teachers have not necessarily been taught traditionally. Such skills include coaching students, curating content, iterating on learning models, knowing and forging relationships with students, and mentoring students in non-academic settings. To develop these skills, teachers need development and support; adult learning must be a priority.

Professional development and other adult learning opportunities should reflect the changing approach to teaching and learning in these schools. It should work...
to shift adult mindsets, competencies and knowledge so that teachers are able to play the myriad roles described above. Given the infancy of personalized learning schools, there are few, if any, proven “best practices” for teachers to emulate. At this stage of development, teachers should work together collaboratively to discern what is working, how, and for whom, and to iterate and test approaches across groups within schools and networks. With the velocity of change in these schools, teachers who lead their peers must possess the skills and competencies to facilitate candid conversations about successes and failures, to foster collaborative processes for adult learning, to establish the norms for productive exchanges as well as possess the ability to differentiate supports for the range of learners amongst their peers. In some ways, teachers leading professional development should be adopting a personalized approach to adult learning that is similar to the one they aspire to use with their students.

Questions We Are Pondering

- To what extent and through what mechanisms are teachers sharing and discussing the struggles and successes they are encountering as they iterate on their model? How are they learning from these challenges?
- How are networks/schools preparing teacher leaders to lead deep, inductive, relevant job-embedded professional learning experiences? What models and standards exist to help guide teachers’ work?
- To what extent do school and network leaders understand andragogy and the elements that make adult learning successful? If those leading professional learning do not have experience in leading adults, to whom can they turn for guidance as they plan, implement and evaluate their efforts?
- How are “peer coaches” being developed? Should the focus be on the transactional elements of coaching or on the preconditions that allow people to successfully develop others (e.g. the psycho-social elements of building trusting relationships)?
A set of themes emerged from this study that can help shape the ways school organizations design and deliver professional learning. A priority for networks, districts, and schools should be to equip teachers with the mindsets, skills, knowledge, and beliefs necessary to successfully guide students toward their vision of personalized learning. While much investment has been made toward developing innovative and creative school models, tools, and systems, school organizations have, perhaps, paid less attention to and been less deliberate in their plans for professional learning. Without a parallel effort and commitment to talent development alongside school and tool development, the promise of personalized learning may not be fully realized. Investing in high-quality professional learning for teachers is paramount. School organizations should strive to be as intentional, creative, and innovative in building professional learning experiences for their teachers as they have been in developing their personalized learning models for students. The question, then, is: How can systems and schools best cultivate educators who are able to facilitate student learning and achievement in these new school models?

Some general themes emerged from the study that should inform the design of professional learning experiences for teachers in personalized learning schools.

**Theme 1**

*Form the adults so that they can form their students*

With the dramatic shifts in the ways in which teachers and students engage in work in schools and with the shift toward student ownership of learning, it is critical that systems and schools attend to the development of adults so that they can, in turn, help develop students. Teachers themselves do not yet have robust mental models of what personalized learning means. And so, schools must invest in teachers to help them develop the scope of competencies, mindsets, beliefs and skills necessary to, in turn, develop their students.

**Theme 2**

*Cultivate the capacity of teachers to lead job-embedded professional development*

Teachers, who are seen as being innovators in new models, are being asked to design and lead job-embedded professional development in strategies and approaches that are new and still evolving. Teacher-led, job-embedded professional development is the centerpiece of most personalized learning schools’ professional learning offerings. NAATE sees the need for training and development of teachers in adult learning so that they are able to design and deliver high-quality professional development. This is a critical precursor to implementing meaningful job-embedded professional learning that improves teacher practice.

**Theme 3**

*Leverage the rapidly evolving research base to bridge the divide between academia and K-12 education*

It is vital for teachers to benefit from rapidly evolving understandings about learning theory and child development. Major research findings and relevant discoveries in these fields should be understood and leveraged by schools in order to make decisions and shape teacher practice to cultivate confident, self-driven learners.
Articulate purpose of learning experiences

It is clear that teachers need support in fully leveraging the various tools and resources that are available to them. With this shift toward teachers as choreographers, it is important to articulate for each available tool when it should be used and for what purpose. Such clarity would better enable teachers to intentionally plan individualized instructional pathways for students. School organizations should reflect on the extent to which they have been deliberate in matching instructional approaches to the needs of students and teachers.

Schools should be clear about the utility of each learning modality or tool in order to support teachers to:

- determine what experiences best meet a student’s needs and interests.
- determine which learning opportunities are best suited for a student’s area for growth and learning style.
- determine how best to leverage various modes of learning for specific learning goals (i.e. when and for what purpose to use each learning tool at a teacher’s disposal).
- deliberately choreograph students’ experiences so that they offer a balanced diet of individual, small group and large group learning experiences.

Once school organizations have a clear articulation of their portfolio of learning experiences, teachers will be better able to assemble a set of personalized learning experiences for students that are integrated and complementary to one another. When teachers are appropriately using the tools at their disposal, the opportunity to develop students’ skills and content knowledge will expand. Teachers will need to further develop their own pedagogical content knowledge in order to support learning experiences that are challenging and developmentally appropriate for each and every student.

Conduct audits to identify opportunities for academically rigorous learning

It also seems important for personalized learning schools to assess what avenues and portions of the day exist for students to engage in higher-level work, problem-solving and critical thinking. School organizations should explore the extent to which the learning experiences of students are appropriately challenging for them. With the proliferation of blended learning platforms and other vehicles for skill development, schools should remain attentive to how they are ensuring there are opportunities for deep learning.

School organizations might:

- support teachers’ reflection and collaboration on the development of academic rigor and standards of their personalized learning approaches.
- set clear expectations for when and how small-group and whole-group exploration of common content should happen.
- conduct an audit for how blended learning platforms and the data they generate are being utilized.
- conduct frequent classroom observations and coaching sessions to assess the quality of learning of innovative teacher practices, assignments and assessments.

Equip teachers for the psychological and cognitive aspects of student-driven learning

Ultimately, personalized learning models seek to put learning in the hands of students; they own and drive their own learning experiences. To successfully deliver on this promise, school organizations need to fully recognize the profundity of this shift, and be clear about the mindsets, attitudes, behaviors, and skills required on
the part of the adults. For teachers to cultivate students’ self-awareness, self-reflection, and capacity to diagnose and address areas for improvement, they must have a deep understanding of metacognition and psychology more broadly. They need to develop their own capacity to think about thinking (i.e. metacognition).

School organizations should determine how well they equip teachers to:

- leverage relationships with students in order to elevate students’ expectations of themselves and their peers.
- cultivate students’ capacity to articulate and assess their own performance, areas for improvement and pathways for meeting their goals.
- develop shared language with students to name their strengths, identify areas for growth and determine potential obstacles they may face as they are learning.
- pose questions and share observations with students to deepen their thinking and understanding about themselves and what they need to work on in order to grow as learners.

Educate teachers in how to provide feedback and support student goal-setting

Student goal-setting is ubiquitous across the range of personalized learning models. School organizations might consider offering in-depth development and support to teachers around goal-setting techniques, so that goals are specific, motivational, and helpful to students as they progress. Given the amount of time dedicated to this activity across models, it would be fruitful for school organizations to ensure student goal-setting activities are consistent with the extant literature.

School organizations might consider how they support teachers to:

- develop their own as well as students’ language to describe performance within specific content areas.
- help students set goals that are specific, appropriate and motivating.
- leverage the research base to in order to create the optimal conditions for students to receive and enact feedback, a critical element of personalized learning settings.

- base feedback and instructional decisions on a deep understanding of their content area, such that goal-setting and instructional decisions are appropriate, and content and context specific.

Develop teacher capacity to build relationships

Students thrive when they feel they are seen, heard, and understood. Personalized learning models are predicated on teachers’ understanding of each student at a personal level, including his/her interests, learning style, areas of need, and personal characteristics and traits. The ability to forge relationships with students is critical to teachers’ capacity to serve and support their students. School organizations should recognize the skills and competencies necessary to cultivate strong, productive relationships with students and should be as explicit in developing teachers’ skills in this area as they are in cultivating instructional strategies.

Specifically, school organizations should give consideration to how they:

- develop teachers’ capacity to navigate the social and emotional aspects of the learning process.
- support teachers with the skills and competencies necessary to forge bonds with students across cultural, racial, socio-economic, gender, and other potential lines of difference.

Acknowledge the skills needed to psychologically support students

Ideally, in personalized learning schools, teachers are nudging, encouraging, gently suggesting, and questioning students so that they are able to own their own learning. Teachers should be exposed to the research that reveals the importance of teachers’ social and emotional competence in motivating and nurturing students to reach high levels of academic achievement. Cultivating students’ capacity to be metacognitive and self-regulated requires productive and trusting relationships between teachers and students. Teachers should be
taught the skills necessary to forge bonds with students that enable them to foster students’ sense of self-efficacy while also encouraging (and perhaps sometimes pushing) them to persist.

Without social emotional competence on the part of teachers, students are likely to fail to reach standards that they feel are out of reach. In personalized learning models, teachers are serving as coaches, cheerleaders, critical friends, and mentors. Clearly articulating the skills necessary for each of these roles and then supporting teachers to serve in these roles is crucial.

Specifically, school organizations might consider how to equip teachers to:

- recognize and foster the mindsets necessary for students to tackle challenging coursework and develop strategies to overcome obstacles.
- intentionally attend to students’ acquisition and application of socio-emotional concepts in the service of their learning (e.g. persistence, collaboration, help-seeking, conflict resolution).
- cultivate relationships and classroom communities that foster a safe and supportive learning environment in which students can feel secure even when they are vulnerable or academically challenged.

Make clear expectations for teacher use of data

While the aggregation and streamlining of data continues to evolve, school organizations should work toward a clearer articulation of how teachers should use data. Whether it is learning how to use the data generated from blended learning platforms, or how to prioritize the breadth of data available to them, teachers should have guidance on how to leverage the powerful information they now have at their fingertips in order to inform their pedagogical decisions and student interventions. Without a clear understanding of how to prioritize and use data, teachers’ capacity to personalize learning is diminished.

Specifically, school organizations might consider to what extent they:

- have clear protocols or defined expectations for how data from multiple sources is prioritized and used by teachers.
- support teachers to interpret data.
- have a method by which teachers use data to inform specific pedagogical and content-related decisions.

Equip teachers to lead adult learning

At both the school and network level, teachers are playing an expanded role in the development of their colleagues in personalized learning settings. Teachers are seen as holding the knowledge necessary to help one another develop and share new practices. Relatively new teachers are being asked to coach and support brand new teachers who are typically being hired each year as schools grow. They are leading onboarding programs for new hires, providing support to first year teachers, and leading a wide range of professional development offerings. School organizations should recognize what competencies are needed by teachers to serve in these roles. Given that schools are investing heavily in professional learning efforts, they should make it a priority to ensure that the impact of these efforts is as powerful as possible by attending to the developmental needs of those who are designing and leading professional learning.

School organizations also stand to benefit from articulating more clearly their expectations for peer-to-peer collaboration, coaching, and feedback. They should also create forums that model for teachers how to acknowledge and address areas for improvement, encouraging teachers to share and learn from their challenges as well as their successes. School organizations might consider to what extent they:

- have structures to support peer-to-peer learning amongst teachers that encourages self-examination and improves practice.
- define the role of teacher teams so that they are highly productive.
- prepare teacher leaders for the various roles schools are assigning to them.
- invest in those who lead professional development so that they are skilled designers and facilitators of adult learning.
SUMMARY

The primary purpose of this study is to help inform the field about what competencies, skills and mindsets are necessary for teachers to be effective in personalized learning settings. NAATE sought to provide insights about what areas of strength and areas of growth it observed. In addition, NAATE is interested in better understanding personalized learning so that the organization can determine to what extent its current offerings meet the needs of teachers in these settings and where the organization might expand its programming.

NAATE has learned a tremendous amount through this study and is enthusiastic about the opportunities it sees to leverage its experience and expertise to support educators in personalized learning schools.

Based on the NAATE team’s understanding of the personalized learning teacher competencies, NAATE believes it is well-suited to play a role in developing teachers in personalized learning settings. NAATE’s core competency is creating high-quality adult learning experiences that lead to changes in teacher beliefs, mindsets, and practice. Moreover, NAATE is committed to bringing research to bear on instructional and leadership practice in fields ranging from cognitive psychology and resiliency to collaboration, teaming, and leadership. NAATE feels strongly that teachers stand to benefit from exploring the nexus between lived practice, and theory and research. NAATE’s study of teacher practice in personalized learning settings highlighted the value of this approach to adult learning, as much is known and still being discovered about how young people learn and thrive that can be brought to bear as new school designs seek to better serve young people.

IMPLICATIONS for NAATE

At this point in the NAATE team’s examination of schools, the findings suggest that school organizations stand to benefit from a clear articulation of how they cultivate, develop, and make clear the expectations of teachers along each of the five domains described in the study. School organizations should be intentional and clear about how teachers should go about executing against the teacher competencies described in the various frameworks that are synthesized in this report (i.e. TNTP, JFF/CCSSO, LEAP, iNACOL). School organizations should be realistic about the support and development necessary for teachers to shift their perspective on what it means “to teach” so that they can successfully meet the ambitious promise of new and innovative school models.

NAATE has a proven track record of delivering high quality professional learning to top tier educators. The current NAATE curriculum addresses foundational aspects of practice that are relevant to personalized learning schools. Through the present study, NAATE has a deeper understanding of the components that are vital to personalized learning settings: pedagogy and content, social and emotional learning, metacognition, data and assessment, teacher leadership and adult learning. The present study has allowed the NAATE team to begin to map out content that will extend the impact of NAATE by incorporating these learnings into new elements of NAATE programming. While these will be tailored to the needs of personalized learning educators, NAATE’s belief is that the content of such learning opportunities will also be beneficial to teachers in a broad range of school models.
Alignment Between NAATE’s Approach to Adult Learning and Personalized Learning

NAATE emerged from the initial phase of its study confident that its approach to adult learning is aligned to the needs of personalized learning educators. NAATE’s pedagogy and content leads to shifts in mindset. The program is personalized: teachers make meaning for themselves and emerge from the program with a clearer understanding of their areas for growth. By design, NAATE does not advocate for particular pedagogical approaches, tools, or tactics. Rather, NAATE seeks to cultivate in participants the capacity to be inductive and metacognitive across a set of practices in order to improve their capacity to serve students and support peers within the unique environment in which they operate.

NAATE is predicated on a set of beliefs and design that seem to be highly aligned to the needs of personalized learning schools. NAATE models some of the practices that personalized learning schools should be working to cultivate in their teachers and school leaders: self-motivation, learner-driven learning, peer-to-peer exchange, metacognition, and personalization of learning pathways. NAATE’s beliefs and its approach to adult learning are well aligned to the general themes revealed by this study.

Alignment Between Themes of Study and NAATE’s Core Values and Approach

<table>
<thead>
<tr>
<th>THEME OF STUDY</th>
<th>NAATE CORE VALUES &amp; APPROACH</th>
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<tbody>
<tr>
<td>1 Form the adults so that they can form their students</td>
<td>NAATE is predicated on the belief that, in order for schools to form young people, they must form the adults who teach and lead them. NAATE transforms participants both professionally and personally by shifting their mindsets and beliefs. NAATE provides teachers with an inductive, peer-to-peer learning experience that shapes their instructional practice with students.</td>
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<tr>
<td>2 Cultivate the capacity of teachers to lead job-embedded professional development</td>
<td>NAATE views experienced high-performing teachers as the key factor to student and school success. Top-tier teachers are a valuable resource and can play a critical role in their schools based on their experience and expertise, and their capacity to influence, lead and develop their peers. NAATE exposes teachers to adult learning theory and fosters their capacity to lead high-impact professional learning in one-to-one, one-to-few (small group), and one-to-many (large scale professional development) settings, all of which are being utilized in personalized learning settings. Developing this tier of the teaching profession is a critical first step in realizing the promise of job-embedded professional learning.</td>
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<tr>
<td>3 Leverage the rapidly evolving research base to bridge the divide between academia and K-12 education</td>
<td>NAATE’s pedagogy sits at the nexus of theory and lived practice. The case study method requires participants to analyze problems of practice through discourse - and evidence - based inductive learning that is rooted in research and theory.</td>
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By examining the teacher competencies needed by teachers and educators more broadly in these settings, NAATE has gained insights into how it might deepen its capacity to serve teachers. NAATE will continue to explore how it might more broadly serve personalized learning schools during the next phase of this study. Some preliminary ideas to date include the following:

- create targeted programs for NAATE alumni who work in personalized learning schools, extending their learning and providing for a way to personalize their own learning and development.
- make available site-specific, job-embedded professional learning opportunities to provide a resource for peer-to-peer exploration of practice.
- lend NAATE’s expertise to provide personalized learning organizations guidance on how to think about and design robust professional learning programs.
- partner with experts in academia as well as K-12 education to support the development of professional learning opportunities that extend beyond NAATE and which address the critical domains described in this study.

In terms of content, NAATE’s program is positioned to serve as a foundation upon which personalized learning-focused content can be built. To fully address the professional learning needs in these settings beyond the current NAATE program, NAATE can pursue a plan to build out additional content in the five domains described in the study, tailored to specific unique conditions of these schools. The current NAATE curriculum addresses foundational aspects of practice that are relevant to personalized learning schools. Supporting & Leading coursework provides teachers with knowledge and understanding about how to coach and lead peers, provide authentic peer feedback, influence and lead without formal authority, engage in design thinking, and forge healthy interpersonal relationships. Teaching & Learning coursework includes the study of the way teachers’ social and emotional competency shapes teacher-student relationships, the ways in which teachers’ pedagogical content knowledge contributes to and detracts from student mastery, the role questioning plays in fostering student learning, and the importance of students understanding and taking ownership of their own performance. Through the present study, NAATE has a deeper understanding of the components that are vital to personalized learning settings. The present study has enabled NAATE to begin to develop content that will extend the impact of NAATE by incorporating these learnings into new elements of NAATE programming. While these will be tailored to the needs of personalized learning educators, NAATE’s belief is that the content of such learning opportunities will be beneficial to teachers in a broad range of school models.
This project is designed to identify strengths as well as areas of opportunity to bolster the practice of teachers in personalized learning settings. Contained in the report are sets of questions within each of the five domains that relate to specific personalized learning growth areas. These questions should be viewed as a resource for school organizations interested in strengthening their approach to support and development of educators. NAATE’s purpose is not to arrive at a way to codify practices in still-evolving models. Rather, the aim is to foster a dialogue amongst teachers and school leaders that leads to a clear articulation of what constitutes high-quality, personalized learning within a specific context and at a particular point in a school’s evolution—NAATE recognizes that as models evolve, competencies may shift or change.

The aims of personalized learning schools are ambitious and promising, and stand to radically re-shape both how students learn and what it means to “teach.” With shifting expectations of educators, comes the requirement for said educators to tend to their own learning needs. It seems imperative that personalized learning schools invest in professional learning/talent development as they work to refine their models and approaches to student learning. As network leaders consistently shared with us, the shift in mindsets and competencies required of teachers in personalized learning settings is significant. Teachers must relinquish a significant amount of control along with any notion that they are the sole “experts.” They must be flexible and adaptive, and be equipped with the skills and knowledge necessary to be instructionally responsive, in real-time, to the students before them based on their cognitive and non-cognitive needs. Teachers need to forge trusting and strong relationships with students, and cultivate students to be metacognitive and self-driven at levels previously rarely required of K-12 learners. And teachers must do all this while the environments are undergoing rapid-cycle changes that are informed, in part, by their own experiences. Not surprisingly, teachers report feeling the demands on them are both exhilarating and exhausting. The question, then, is how to ensure that schools are attending to the professional learning needs of teachers in ways that help them to be better equipped to be more deliberate, purposeful, and reflective in their work.

Magnifying the need for adult learning is the fact that teachers must now shift toward making transparent to students the actions and decisions that have typically been the “exclusive” domain of adults (i.e. the shift from doing something for students, to developing students to do these things for themselves, such as planning for their learning, reflecting on their areas of need, selecting and designing assignments). In some ways, this shift is analogous to that of a teacher moving from the classroom into a coaching position; merely because one has mastered a quality or skill does not necessarily mean she can foster it in someone else. As the NAATE team came to see, the competencies necessary to support student-led, personalized instruction are nuanced, sophisticated, and complex. The priority areas for growth described in this study are those the NAATE team determined to be the most high-leverage areas of practice at this particular point in the evolution of personalized learning models. No doubt these will evolve as the models themselves mature. Still, the growth areas described will remain key in ensuring students are learning and achieving high standards of excellence.
CONCLUSION

IN THE NEXT PHASE of this study, NAATE will also explore the mechanisms best suited for the organization to deliver programming to personalized learning educators. NAATE has begun exploring the capabilities and offerings of other professional learning providers and online platforms, and will continue exploration of these organizations to determine how a constellation of resources might be assembled to meet the needs of teachers in personalized learning schools.

NAATE’s experience over six years serving high performing educators, coupled with the present study in personalized learning schools, reinforces the organization’s belief that great teachers will serve as a central resource in this work. Teachers’ formation and professional learning will be essential to the formation and success of the students that they serve in these new school models.

FUTURE RESEARCH

NAATE will continue this study over the next six months to broaden the number of schools included, deepen learning about the teacher competencies in the domains described here (with particular continued focus on data and assessment, and teacher leadership and adult learning), and further define the professional learning needs of teachers in personalized learning. NAATE seeks to further explore a set of questions including:

- Can a suite of foundational professional learning experiences be designed to meet the broad and unique needs of teachers in personalized learning settings?
- How do we create personalized pathways of authentic learning for adults in personalized learning schools?
- What specific resources exist to help meet these objectives? In higher education? In the K-12 field? How might experts in these institutions be best leveraged to inform professional learning for educators?
- At what scale can these resources/programs be made available to meet the growing promise of student-centered and personalized learning schools? How?
Bibliography


The findings described in this paper reflect research, school visits, classroom observations, interviews, and knowledge of schools based on NAATE’s work with teachers and school leaders from personalized learning schools. This report was informed by the following schools and school networks:


Contribute to the effectiveness, innovation, vitality, and self-renewal of the teaching profession, as well as to school and community. **INACOL**

- Seek appropriate individual or shared leadership roles to continue professional growth, advancement, and increasing responsibility for student learning and advancement. **JFF/CCSSO**

- Be flexible about working in a team-teaching setting and collaborating with colleagues to better personalize student learning. **TNTP**

- Develop a keen ability to identify the data that will provide most actionable evidence about student performance. **TNTP**

- Use variety of data to confirm learners’ academic level and their response to varying levels of academic challenge. **LEAP**

- Use data from multiple sources, including data systems, in a complementary way to inform and adjust individual student instruction and groupings. **INACOL**

- Utilize in-depth understanding of content and learning progressions to engage learners and lead individual learners toward mastery. **JFF/CCSSO**

- Tailor content and instructional strategies to individual learning goals, needs, and interests. **INACOL**

- Co-create learning experiences with students based on interests and needs. **LEAP**

- Ensure students understand how to progress through content independently, troubleshoot problems, and seek peer assistance as needed. **TNTP**

- Enable students to set goals, measure progress and determine performance. **JFF/CCSSO**

- Partner with learners to identify the sources, methods and frequency that will be used to assess progress. **LEAP**

- Shift ownership and analysis of data to students to promote independent learning. **INACOL**

- Engage in deliberate practice and persevere toward ambitious, long-term educational and professional goals. **INACOL**

- Build strong relationships that contribute to individual and collective success. **JFF/CCSSO**

- Set expectations and support to enable learners to work in groups/teams as they create evidence of learning. **LEAP**

- Research, pilot, assess or scale solutions to classroom management problems that cannot be with traditional tactics. **TNTP**
PERSONALIZED LEARNING TEACHER COMPETENCIES
CATEGORIZED BY DOMAIN

Below, the NAATE team re-categorized the competencies of each framework by the domains described in this report. All competencies from each framework fit within one of the five domains: 1) Pedagogy & Content, 2) Metacognition, 3) Social Emotional Content, 4) Data & Assessment, and 5) Teacher Leadership & Adult Learning.

DOMIAN 1
PEDAGOGY & CONTENT

TNTP
- Simultaneously manage multiple learning configurations (e.g., large group, small group, independent working time) while ensuring high-quality instruction across the board.
- Be prepared with a “Plan B” to address unforeseen problems that can crop up when using online curricular resources and other digital learning tools.
- Create short- and long-term instructional plans that incorporate a variety of resources and tools.
- Be flexible with those plans so they can be updated and changed in real time.
- Personalize instruction to enable students to focus on the tools, content, skills and pacing that are appropriately rigorous for them.
- Possess exceptional adaptability and a familiarity with a wide variety of lesson planning tools and instructional methods.

iNACOL
- Shift from teacher-led instruction to student-centered learning for the purposes of meeting individual needs and fostering engagement and motivation.
- Create learning environments that are flexible and personalized, dependent on real-time data, direct observation, and interaction with and feedback from students.

- Test innovative curricula and instructional delivery models, sharing what they learn with colleagues to promote school-wide achievement gains.
- Rethink conventional “grade” and “class” distinctions, working with colleagues to help students follow personalized learning paths that draw on educators’ diverse areas of expertise.
- Research, pilot, assess or scale the overall structure or individual components of an innovative instructional mode.
- Research, pilot, assess or scale new curricula or instructional delivery methods.
- Research, pilot, assess or scale new approaches to support student learning progression, either within structured classroom periods or as part of a more flexible schedule.
- Research, pilot, assess or scale a shift to mastery-based progression that may pull some or all students out of a standard grade-level classroom structure.
- Use technology creatively and purposefully to work effectively and efficiently.
- Connect learners to sources of information beyond the classroom teacher and textbook.
- Proactively initiate change in response to students’ needs and progress.
LEAP

- Design learning experiences that explicitly connect new content to prior knowledge and skills.
- Allow learners to move through content at varied rates regardless of their starting level.
- Allow learners flexible, ongoing and repeated opportunities to demonstrate competency.
- Determine classroom/school policies for learning recognition and progression that take into account varying speeds of learner competency.

JFF / CCSSO

- Utilize in-depth understanding of content and learning progressions to engage learners and lead individual learners toward mastery.
- Have knowledge of the sub-skills involved in effective communication and apply it to instructional strategies that develop learners into effective communicators.
- Use a mastery approach to learning.
- Provide opportunities for anytime/anywhere and real-world learning tied to learning objectives and standards.

- Develop and facilitate project-based learning experiences.
- Use collaborative group work.
- Demonstrate an orientation toward and commitment to a personalized, learner-centered vision for teaching and learning.
- Customize the learning experience.
- Use technology in service of learning.
- Facilitate and prioritize shifting to and maintaining a learner-centered culture.
**TNTP**

- Prepare students to manage themselves during independent and student-run group learning time.
- Make sure students understand how to progress through content independently, proactively troubleshooting problems, and seeking assistance from peers as needed.
- Make those plans understandable to everyone who will potentially access them, including colleagues, administrators, parents, and students themselves.

**iNACOL**

- Model and encourage others to be independent and self-directed learners.
- Openly and frequently share successes, failures, and challenges.
- Look objectively at all results (both positive and negative), and help others to do the same.
- Apply lessons and takeaways about their own experiences as learners, both online and offline to their work with students.
- Engage in problem solving through continuous planning, designing, testing, evaluation, and recalibration of teaching methods.
- Create ways to move ownership and analysis of data to students to promote independent learning.
- Continually evaluate technologies, tools, and instructional strategies to ensure their effectiveness.
- Continuously take note of what is or is not working (via student-level data, technology applications, pedagogical strategies, supervisor feedback, etc.) and identify a plan of action.

**LEAP**

- Partner with learners to document past learning in order to devise future learning plans.
- Partner with learners to explore: ways to modify or vary content, the where/when of learning and other aspects of their learning experiences to align with their interests, strengths and needs.
- Offer flexible modalities, groupings and times/places for learning to help meet individual learner needs, strengths and interests; balance individual needs with the needs of the class community.
- Partner with learners to continuously align learning opportunities with learners’ interests, strengths and needs.
- Partner with learners to identify the most suitable learning format for their current academic level (e.g., class, groupings, activities, software).
- Articulate short- and long-term learning expectations that are appropriate for learners’ current academic levels.
- Clarify expectations about the pace of progress and what happens when learners take a longer or shorter time than their peers.
- Ensure that learners are clear with what they will need to know and do to demonstrate competency.
- Offer learners opportunities to gauge and discuss their readiness for demonstrating competency.
- Identify what competencies need to be met to obtain credit, advance and/or receive other recognitions for learning.
- Help learners identify next steps in their learning plan once a competency has been met.
- Engage learners in reflection and assessment of activities to determine efficacy and inform future directions of learning opportunities.
- Prepare students to manage themselves during independent and student-run group learning time.
- Make sure students understand how to progress through content independently, proactively troubleshooting problems, and seeking assistance from peers as needed.
- Make those plans understandable to everyone who will potentially access them, including colleagues, administrators, parents, and students themselves.
LEAP cont’d
■ Offer tools to help learners identify their own interests, strengths, needs and preferences (e.g. interest inventories, checklists, reflection exercises).
■ Encourage and model methods for reflecting on their needs as learners.
■ Encourage learners to think about and articulate how they are learning.
■ Partner with learners to identify the sources, methods and frequency that will be used to assess progress (e.g., self, peer, technology-based methods).
■ Model data examination, discuss progress, and identify challenges and needed supports.
■ Help learners reflect upon their learning strategies and efforts, as well as the result of those strategies and efforts in regards to meeting desired learning goals.
■ Encourage learners to reflect upon and report on effort and strategies as often as reporting on results.
■ Provide learners with a systematic method (i.e. a learner profile) for documenting learning needs and preferences.

JFF / CCSSO
■ Understand and employ techniques for developing students’ skills of metacognition, self-regulation, and perseverance.

DOMAIN 3
SOCIAL-EMOTIONAL COMPETENCE

TNTP
■ Set clear expectations about student engagement norms from the very outset of the year.
■ Increase students’ comfort level with a noisier classroom to accommodate multiple working discussions.
■ Research, pilot, assess or scale solutions to classroom management problems that cannot be solved with traditional tactics.

iNACOL
■ Value collaboration with various stakeholders to enhance student learning.
■ Model a growth-orientation towards learning for self and others.
■ Have an entrepreneurial spirit, and possess creativity, imagination, and drive.
■ Embrace change and model this for others.
■ Embrace uncertainty and ambiguity as part of improving teaching and learning practices.
■ Engage in deliberate practice and persevere toward ambitious, long-term educational and professional goals.
■ Maintain and model persistence, confidence, and optimism to resolve issues.
■ Establish and maintain open communication channels, online and in person, with students, educators, and other stakeholders to support student learning.
■ Develop, practice, model, and embody respectful behaviors in both face-to-face and online learning environments.
LEAP

- Ensure that learners are clear about these expectations and requirements.
- Encourage learners to work with and seek assistance from peers (e.g. on projects, to answer questions, and for help in solving problems).
- Set expectations and support for the development of “team” skills (e.g. negotiation, conflict resolution, and assertion).
- Set expectations and support to enable learners to work in groups/teams as they create evidence of learning.
- Provide guidelines for teamwork that help promote positive team functioning and the development of team skills.
- Cultivate an environment for learners to move purposefully and freely within the classroom to enhance collaboration and peer support.
- Refrain from immediately offering support and solutions when learners begin to struggle, and encourage learners to seek help from peers, technology and other sources to answer questions and resolve problems with their own resources.
- Partner with learners to reflect upon and document their own learning needs and progress.
- Encourage learners to revise their learning strategies based on these reflections.
- Provide feedback that is objective and non-judgmental.
- Encourage learners to experiment and try multiple strategies to solve problems.
- Celebrate learner efforts even when they “fail”.
- Set expectations and support for receiving, interpreting and applying feedback from others.
- Coach learners to identify needs and advocate for those needs to be met.
- Provide support and guidance to build learners’ assessment literacy and skills.
- Meet with learners to discuss the effectiveness of the current plan for assessing and monitoring progress.

JFF/CCSSO

- Convey a dedication to all learners—especially those historically marginalized and/or least served by public higher education—reaching college, career, and civic readiness.
- Engage in deliberate practices of adapting and modeling persistence and a growth mindset.
- Build strong relationships that contribute to individual and collective success.
- Promote student agency and ownership with regard to learning.
- Design, strengthen, and participate in positive learning environments (i.e. school and classroom culture) that support individual and collaborative learning.
- Contribute to college and career access and success for all learners, particularly those historically marginalized and/or least served by public higher education due to differences in background, demographics, learning style, or culture.
**Tntp**
- Collect data from online and in-person lessons – recognizing that online data may be more accessible, but that the information is not always high-quality.
- Develop a keen ability to identify the data that will provide most actionable evidence about student performance.
- Accurately analyze student data to identify trends and learning gaps.
- Capitalize on online tools that deliver data points in real time and use this information to make adjustments on the fly.
- Research, pilot, assess or scale innovative assessment practices.

**Inacol**
- Use qualitative and quantitative data to understand individual skills, gaps, strengths, weaknesses, interests, and aspirations of each student, and use that information to personalize learning experiences.
- Continually assess student progress against clearly defined standards, goals, and outcomes to identify specific topics in which each student needs additional support to achieve mastery of a concept or skill.
- Use data from multiple sources, including data systems, in a complementary way to inform and adjust individual student instruction and groupings.
- Provide resources for students to create evidence of their knowledge in a variety of formats to demonstrate mastery.
- Develop and deliver valid and reliable assessments, projects, and assignments that meet standards-based criteria and assess learning progress by measuring student achievement of learning goals.

**Leap**
- Regularly solicit and compile information regarding learners’ interests, strengths and needs.
- Review available information regarding learners’ prior academic performance (e.g. testing, work samples, portfolios).
- Conduct observations and formative assessments to confirm learners’ current academic level and their response to varying levels of academic challenge.
- Use all available data to determine where a learner falls on the appropriate learning progression.
- Use formative assessment data to help determine appropriate pacing and instructional support.
- Adjust learning goals and plans based on demonstrated progress.
- Provide learners with access to multiple assessment options.
- Work with learners to create multiple methods for demonstrating competency with learning standards.
- Partner with learners to select the content, product or process they will use to demonstrate proficiency, as well as devise the methods that will be used to show evidence of their learning.
- Create an organized and accessible system for tracking evidence of learning (e.g. performance, assessment, credits and competency progression).
- Provide learners with ongoing access to their performance data to help identify academic needs.
- Provide learners with the data sources and expectations necessary for planning learning goals.

**Jff / Ccsso**
- Use assessment and data as tools for learning.
- Analyze evidence to improve personal practices.
DOMAIN 5
TEACHER LEADERSHIP & ADULT LEARNING

TNTP
- Be flexible about potentially working in a team-teaching setting, collaborating with colleagues who possess different strengths to better personalize student learning.

iNACOL
- Demonstrate the professional responsibility to contribute to the effectiveness, innovation, vitality, and self-renewal of the teaching profession, as well as to their school and community.
- Collaboratively, transparently, and proactively seek out feedback from students, parents, and colleagues to continuously improve instruction and teaching practices.

JFF / CCSSO
- Demonstrate an orientation toward and commitment to lifelong professional learning.
- Seek appropriate individual or shared leadership roles to continue professional growth, advancement, and increasing responsibility for student learning and advancement.