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The Promise of Personalized Learning in Rural America

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Introduction

In 2009 in a very rural community off the coast of Maine, students were dropping out of high school at an alarming rate. Deer Isle, Maine is home to a thriving fishing and lobster industry, and there is the sense there that one doesn't need formal education credentials to make a good living. Facing the lowest graduation rate in the state—only 57 percent graduated that year—Todd West, the principal of Deer Isle-Stonington High School, saw an urgent need to increase the relevance of school for his students. Weighing a number of school improvement strategies, West began to explore an approach called "personalized learning," which seemed to hold great promise for improving student engagement.

Since then, Deer Isle-Stonington High School has launched a marine studies learning pathway geared toward students who might otherwise be tempted to drop out and go into lobster fishing full time. Three teachers co-teach the marine studies pathway class in the afternoon, continually grouping and re-grouping the students based on their academic gaps and individual pace of progress. As part of the pathway, students can enroll in a new U.S. history course framed around New England fisheries or work on credit-bearing projects with fishing-related businesses and tradespeople in the community. Early results from Deer Isle-Stonington's model are encouraging: Graduation rates rose dramatically, exceeding 90 percent as of 2012,[1] academic performance is better, and—based on attendance and disciplinary outcomes—students appear to be more engaged.[2]

Around the country, a small but growing number of schools and districts are leveraging personalized learning models to create more innovative and effective learning experiences

for students. Personalized learning is a broad term referring to instruction customized to meet a student's individual skill level, learning style, and interests through differentiated learning environments—and often through the smart use of technology. Although personalized learning is gaining traction, efforts to develop high-quality personalized learning models have largely been concentrated in urban schools. Deer Isle-Stonington is a rare example of a rural school that has both the interest and capacity required to implement personalized learning. For most of the nearly one in five students attending rural schools in America, the schooling experience has yet to embrace these promising innovations in teaching and learning.

Personalized learning could help overcome some of these challenges—both those common across geographies and those specific to the rural space—by increasing student access to teachers and specialized coursework and deepening the connections between K–12 schooling and postsecondary opportunities.

This is a missed opportunity for rural schools, where many students face bleak postsecondary outcomes. While some of their challenges are similar to those in the urban context, rural schools also confront a number of unique issues: geographic isolation, human capital shortages, and a rapidly changing economy. Personalized learning could help overcome some of these challenges—both those common across geographies and those specific to the rural space—by increasing student access to teachers and specialized coursework and deepening the connections between K–12 schooling and postsecondary opportunities. However, the approach to personalized learning will require thoughtful tailoring, community input, and appropriate policy conditions in order to truly meet the needs of rural students and educators. And though rural personalized learning pioneers are few and most are in the earlier stages of implementation, they do show what can be possible.

This paper explores applications of personalized learning in rural schools, discusses and proposes solutions to the practical and policy barriers to implementation, and shares lessons learned from early adopters of personalized learning in rural schools.

Student Outcomes in Rural America

Rural schools serve 18 percent of all students in America.[3] These schools play a vital role in the rural landscape by not only educating youth but also contributing to the social fabric of a community. Schools often act as a physical hub for cultural and athletic events, connect the community to health and other social services, and even serve as shelter during natural disasters.[4] In many ways, they both reflect and foster the social capital and interconnectedness of rural areas.

Schools both reflect and foster the social capital and interconnectedness of rural areas.

Despite their centrality to the community, rural schools face profound challenges that are often distinct from the pressing needs of urban schools. In sprawling, sparsely populated communities, students face a number of barriers around transportation and infrastructure. Geographically isolated students must take long bus rides to get to and from school, time that could otherwise be spent interacting with teachers, peers, and their families. At the systems level, districts spend a higher proportion of their total budget on school transportation compared to non-rural areas, just one example of the economies-of-scale challenges of small, remote schools.[5] Technology infrastructure is also a challenge: While wireless connectivity in rural schools is improving, connection speeds are often slow, and schools sometimes don't have enough devices to serve students.[6] Students may not have internet access at home either—only 55 percent of rural residents have broadband access at home compared to 67 percent in urban areas and 70 percent in suburban regions—restricting their ability to leverage online academic resources and connect with the broader world.

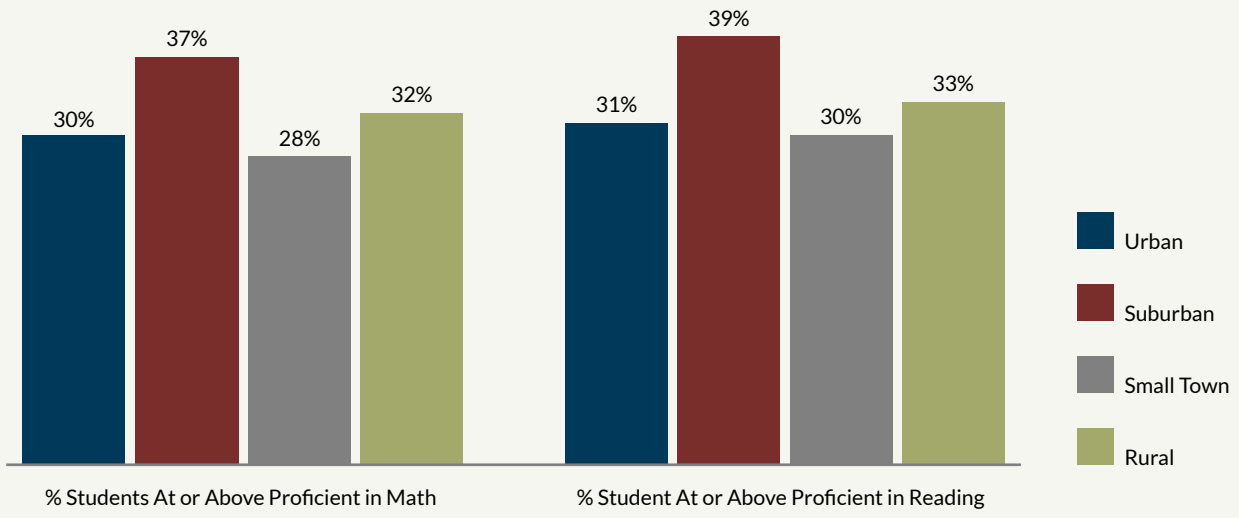
These infrastructure challenges don't only affect students—they also have significant human capital implications for rural school districts in attracting and retaining talent.[7] Potential teaching applicants may have concerns about the rural lifestyle, long commute times, and

isolation from cultural amenities available in more populated areas.[8] As a result, many rural schools and districts must contend with small talent pools and staffing shortages.

These staffing shortages create enormous challenges for schools. Rural teachers sometimes have to teach multiple subjects and grades, which means there's a lower likelihood they're highly qualified across all of their subjects.[9] A recent study by University of Virginia researcher Daniel Player concluded that rural schools are also more likely to have vacancies in science, technology, engineering, and math (STEM) teaching positions compared to urban teacher labor markets.[10] Lack of scale, in terms of both student enrollment and total number of schools in rural districts, exacerbates these recruitment challenges. Districts serving a small student body may not be able to justify hiring a full-time teacher for a highly specialized subject that only a small subset of students may want to take—such as AP Computer Science—even if they can find a qualified candidate for that position.

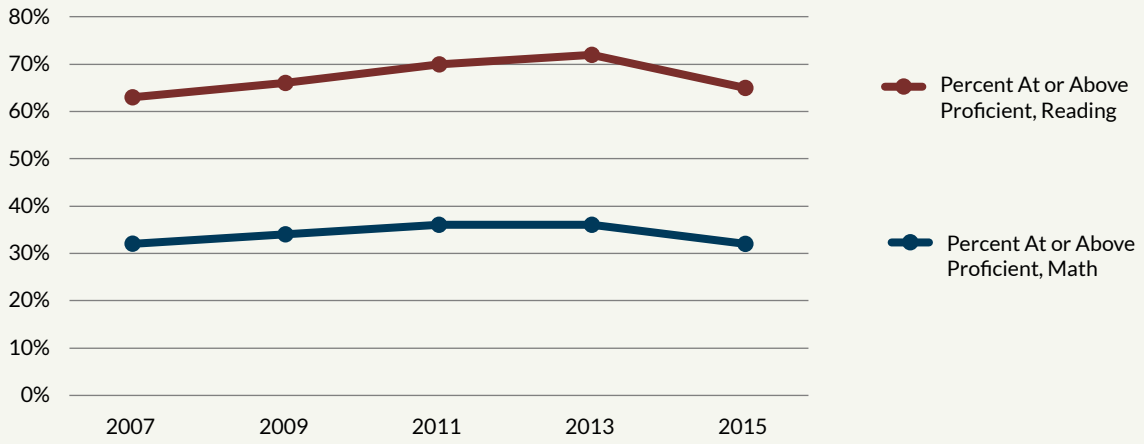
Together, these barriers may contribute to weak academic outcomes among rural students. Although rural students perform slightly better on the National Assessment of Educational Progress (NAEP), a nationally representative learning assessment, than urban students do, their overall proficiency rates are low: In 2015 only one-third of eighth-grade rural students were proficient in math or reading (Figure 1). And troublingly, eighth-grade math and reading proficiency rates fell between three and four percentage points from 2013 to 2015 (Figure 2). While this decline reflects a broader national trend, the drop among rural students was greater than that among students in cities and suburbs.[11]

Figure 1 NAEP Proficiency Rates in Grade 8, by Geographic Locale, 2015



Source: National Assessment of Educational Progress (NAEP), www.nationsreportcard.gov

Figure 2 NAEP Proficiency Among Rural Students in Grade 8, 2007–15



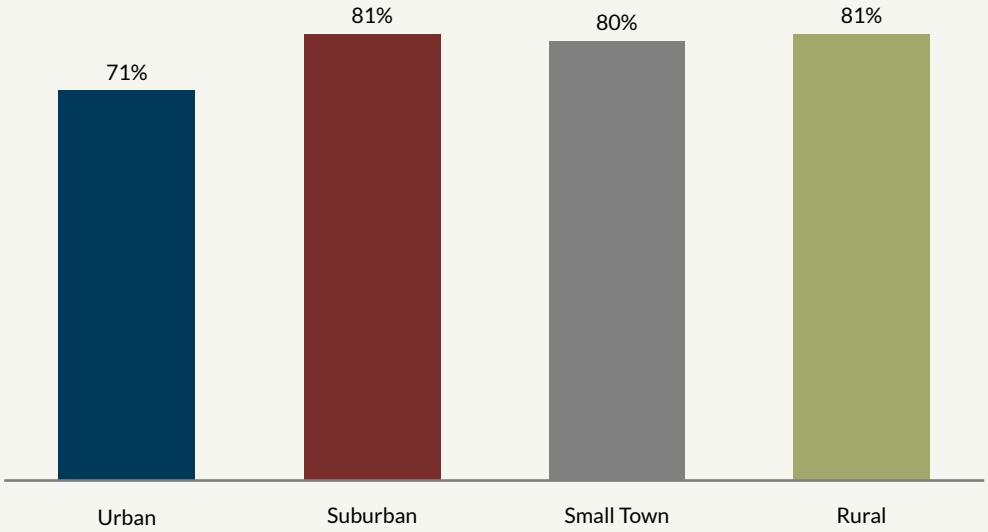
Source: National Assessment of Educational Progress (NAEP), www.nationsreportcard.gov

Federal data from the 2011–12 school year indicate that 47 percent of rural districts in the country did not have even a single student enrolled in Advanced Placement (AP) coursework.

Standardized assessments aside, rural students are also less likely to engage with rigorous coursework at the high school level. For example, data suggest they enroll in advanced math, algebra II, and calculus courses at lower rates compared to their urban peers.[12] And federal data from the 2011–12 school year indicate that 47 percent of rural districts in the country did not have even a *single* student enrolled in Advanced Placement (AP) coursework. In contrast, less than three percent of urban districts had no students taking AP coursework that same year.[13] Lack of rigorous high school coursework has real implications for the ability of rural students to build the academic foundation they need to succeed in college.

Many rural students face limited college and career prospects after completing their K–12 schooling, despite strong high school graduation rates. On average, rural areas actually boast significantly higher graduation rates than big cities. National data from the 2009–10 school year indicate that 81 percent of rural students graduate from high school, compared to 71 percent of their peers in big cities (Figure 3).[14] Even with increased likelihood for high school graduation, rural students are less likely to attend college. About one-third matriculate in college, compared to nearly half of students in urban communities.[15] Poor rural students are at especially great risk: Only 28 percent enroll in a four-year institution immediately after high school.[16] Complex underlying factors are at play, some of which may not relate to a student's academic skill set or economic background. A national survey of nearly 5,000 rural youth found that students with a stronger sense of a rural identity and positive perceptions of their local economy were less likely to aspire to a postsecondary education.[17] These results could indicate that some rural students perceive a difficult trade-off as they near the end of their K–12 schooling—that going to college might mean giving up their rural roots.

Figure 3 Average High School Graduation Rate by Geographic Locale, School Year 2009–10



Source: National Center for Education Statistics, Common Core of Data, https://nces.ed.gov/ccd/

Those who don't attend college enter a rural job market that has changed dramatically over time and reflects the impact of rural to urban population migration, particularly among higher-skilled workers. Career options in rural areas have become less straightforward as traditional agriculture, manufacturing, and mining opportunities—once the backbone of rural economies—have declined.[18] Piedmont, Alabama offers just one example. According to Matt Akin, the superintendent of Piedmont City Schools, the town has struggled since two major employers left. He notes, "The economic outlook for our students is pretty bleak. Our economy was based on textiles, but those jobs have been gone for over a decade."[19]

Many young people now flock to cities to find jobs and, for the first time in this country's history, rural America's population is declining.[20] Worse yet, students who leave their communities to go to college or pursue careers in more urban regions contribute to overall lower rates of educational attainment in rural areas. This "hollowing out" phenomenon results in a lower-skilled workforce in rural areas, which exacerbates economic challenges for individuals and for communities seeking to attract new employers.[21]

Rural communities and schools have leveraged technology and other strategies to try to improve prospects for rural students. But many of these efforts derive from the need to address specific operational challenges, such as a teacher shortage in a required subject or the desire to offer a particular course through an online platform, and few begin with a more holistic assessment of students' short- and long-term learning needs to create a truly integrated instructional approach.

Applications of Personalized Learning in Rural Schools

Since as early as the mid-1990s, education researchers and practitioners have advocated for the use of online and distance learning to offer more varied coursework to students. However, while these strategies can help address teacher shortages and increase course access, they don't provide instruction that is truly tailored to each student's needs.

In the face of these longstanding and emerging challenges, rural schools need to develop creative strategies to dramatically accelerate student academic achievement, engagement, and ability to succeed after graduation. The use of technology, which is not in itself personalized learning, has been heralded as a potential solution to maximize student learning. In fact, discussions around the potential of technology in rural schools are not new. Since as early as the mid-1990s, education researchers and practitioners have advocated for the use of online and distance learning to offer more varied coursework to students.[22] However, while these strategies can help address teacher shortages and increase course access, they don't provide instruction that is truly tailored to each student's needs. And without personal interaction with a teacher, online learning can feel deeply impersonal for students.

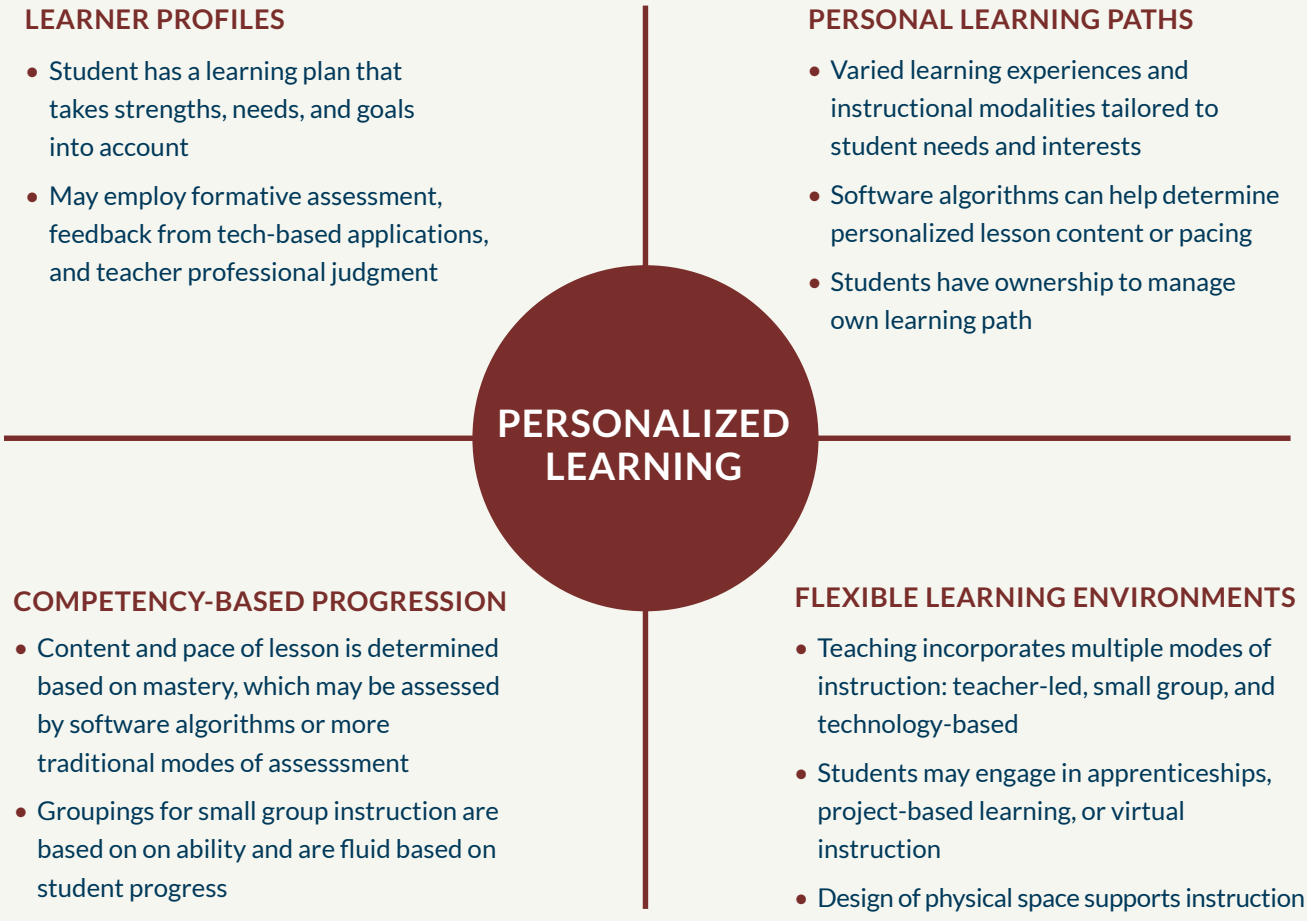
A more nuanced strategy is personalized learning, which can—but doesn't necessarily have to—utilize technology. Personalized learning models redesign educational experiences to meet individual student needs by shifting how, when, and where students learn. While there are many ways to explain personalized learning, a working definition developed by a coalition of educators, philanthropic groups, and education policy groups describes personalized learning as a model grounded in four pillars[23] (Figure 4):

1. **Learner profiles:** Each student has an up-to-date individual profile of his or her academic needs, strengths, and goals that teachers use to inform their instructional planning.
2. **Personal learning paths:** While all students are held to high expectations, each individual has a customized learning pathway based on academic goals and progress.

3 **Competency-based progression:** Students advance from one academic unit to the next, or even one grade to the next, based on whether they demonstrate proficiency in common standards—not based on how much time they've spent in the classroom.

4 **Flexible learning environments:** Learning experiences, including when and where students learn, are based on students' needs. Students learn academic content through a variety of instructional modalities such as direct teacher instruction, peer group collaboration, online learning, and internships.

Figure 4 Overview of a Working Definition of Personalized Learning



Sources: Working definition developed by the Bill & Melinda Gates Foundation, Afton Partners, the Eli and Edythe Broad Foundation, CEE Trust, the Christensen Institute for Disruptive Innovation, Charter School Growth Fund, EDUCAUSE, iNACOL, the Learning Accelerator, the Michael & Susan Dell Foundation, Silicon Schools, and educators

A personalized learning environment does not always require sophisticated technology. However, technology can amplify the benefits of personalized learning for students.

The customization of each student's learning experience—coupled with the expectation that students take ownership over their learning—has prompted advocates to describe personalized learning as a student-centered approach. Unlike blended learning or digital instruction (see Sidebar 1: What Does it all Mean: Personalized, Blended, Online?), a personalized learning environment does not always require sophisticated technology. However, technology can amplify the benefits of personalized learning for students. Adaptive software programs, for instance, analyze user responses to modify instructional content based on what students do and do not currently understand.

Those who support personalized learning believe this approach helps educators better identify each student's needs, address those needs, and ensure that students are engaged. By tracking student outcomes in real time, teachers make instructional decisions based on

Sidebar 1

What Does it all Mean: Personalized, Blended, Online?

Terms for nuanced modes of applying technology in education get bandied about interchangeably, and it is not always clear what they mean, leading to confusion and misunderstanding. And definitions of these terms are not settled—making it challenging to communicate a coherent vision of what students' experience with a given model looks like.

For this report, we've defined **personalized learning** as an approach to teaching and learning based on the principles described in Figure 4 that *may or may not* incorporate one or more modes of technology-based instruction, such as those described below.

Blended learning refers to instruction delivered through a combination of in-person teacher-facilitated instruction typically delivered in a school environment and technology-based instruction that may be pursued based on the student's preferred pace, timing, and location.[i]

Online learning or distance learning refers to instruction delivered exclusively through a technology-based platform, with technology-assisted personal interaction with an instructor and, perhaps, other students required. This model effectively removes a student's geographic location as a factor in course access, relying on technology to facilitate interaction between the student and the content, the instructor, and other students.[i]

Other digital or technology-based learning models rely entirely on a student accessing content through software with no interaction with an instructor or classmates.

i "Blended Learning Definitions," Clay Christensen Institute for Disruptive Education, accessed September 16, 2016, http://www.christenseninstitute.org/blended-learning-definitions-and-models/

student need. And learner profiles enable multiple educators and school leaders to follow how well each student is doing across multiple metrics—providing far more comprehensive information than they would have with infrequent summative assessments alone.

The evidence base on student outcomes associated with personalized learning is small but growing. In 2015 the RAND Corporation, with support from the Bill & Melinda Gates Foundation, released a quasi-experimental study of 62 traditional district and charter schools that have implemented personalized learning. Elementary and middle school students in the study made statistically significant gains on NWEA math and reading assessments compared to peers with similar backgrounds attending schools that weren't utilizing personalized learning practices.[24] Early case studies of three charter schools—KIPP Empower, Summit Public Schools, and the Alliance College-Ready Public Schools—found that transitioning to a personalized learning model appeared to boost student engagement, based on parent and teacher observations as well as student feedback.[25]

Despite the potential of personalized learning and technology to improve student outcomes, adoption is uneven across American schools and concentrated in urban communities. The role of charter schools in the increasing popularity of personalized learning can partially help to explain this trend. Because charter schools have significant autonomy from some state and local regulations, they have historically been at the forefront of personalized learning and education innovation more broadly. But because charter schools are also largely an urban phenomenon, the innovations they develop around teaching and learning have not reached rural communities to the same extent. And in some cases, innovations born in the urban charter school environment—such as those that require advanced technology infrastructure—do not translate well to the rural context. External support for the design and implementation of personalized learning is another factor. Most early investments from funders at the forefront of personalized learning have focused primarily on urban settings.

Although the concept is almost unheard of in many rural communities, many of the core elements of this approach are not. For many years, rural communities have sought to expand access to specialized or college-level coursework, increase student engagement through differentiated instruction, and even use technology to expand opportunities for students.

This uneven adoption means that students in rural areas are not leveraging the potential benefits of personalized learning. Although the concept is almost unheard of in many rural communities, many of the core elements of this approach are not. For many years, rural communities have sought to expand access to specialized or college-level coursework, increase student engagement through differentiated instruction, and even use technology to expand opportunities for students. Bringing these levers together under a personalized learning framework could allow each strategy to build off one another, leading to improved outcomes at both the student and systems level. Without coordinating these efforts under a common framework, schools may only improve discrete pieces of the student learning experience or develop short-term fixes to staffing challenges. Fully cracking the potential benefits of the personalized learning framework requires integrating the approach by using data to guide decisions on how to meet the needs of individual students, providing

flexible and varied opportunities for learning, and letting student mastery set the pace of progression through content. In that integrated scenario, educational technology may not look merely like select students taking an advanced course online when no teacher is available. Instead, it may mean that all math students work with teachers in smaller groups for a portion of instruction and engage in practice sessions supervised by a paraprofessional or guided by adaptive software. The teacher takes output from those practice sessions and adjusts her direct instruction accordingly, reteaching where needed and advancing students who are ready to move on. The hope is that under the integrated scenario, not only might students gain access to advanced content through online courses, but more students might be prepared to engage in those opportunities.

Potential Benefits of Personalized Learning to Rural Students and Schools

The hallmark features of personalized learning could drive improved outcomes for students in rural schools, just as in other settings, and could help address some of the particular infrastructure and systemic challenges rural schools face.

1 Instruction tailored to students' current academic levels and needs can help them catch up and excel.

By providing more differentiated instruction and competency-based progression based on students' individual academic proficiency, personalized learning can potentially advance student learning and close achievement gaps. Challenges around achievement gaps and lackluster student achievement are not unique to rural schools. But personalized learning has yet to permeate the rural education landscape as a strategy for addressing those challenges.

By providing more differentiated instruction and competency-based progression based on students' individual academic proficiency, personalized learning can potentially advance student learning and close achievement gaps.

Schools can provide more differentiated instruction based on students' current academic proficiency in two ways. First, students can receive more intensive small group, or even one-on-one, instruction from teachers if some of their peers are spending part of the class or school day in different learning groups. Under a "station rotation model," for instance, students rotate among multiple stations that each use a distinct instructional approach such as self-directed online learning, small group activities, targeted interventions (e.g., special education), and direct teacher-led instruction. Smaller groups enable teachers to address the specific academic needs of students and ensure that they can engage with each student on a more personal level. At Piedmont Middle School in Alabama, students rotate among working independently on online content, collaborating on team projects, and receiving individualized support from teachers.[26]

Second, teachers serving students of varying skill levels—including those far behind grade level—can adopt high-quality adaptive learning software in their classrooms that will use data to provide instruction targeted at a student's starting point and pace of progress. These types of adaptive tools can also offer formative assessments to help teachers monitor student progress and identify gaps in real time. This data assists teachers in identifying places where students need more intensive instruction, allowing for responsive modification of instructional content and approach.

Differentiated and individualized instruction not only holds potential for students with learning deficits, but also can identify when students are ready to access more advanced learning opportunities.

2 Flexible learning environments and integrated technology can expand the breadth of learning options and address practical challenges related to human capital and infrastructure.

Personalized learning models can provide rural students with greater access to more specialized and advanced coursework that isn't offered through traditional course offerings at their schools. Previously, rural students had limited distance learning options, often through their state's single virtual school. Now, states are increasingly leveraging "Course Access" or "Course Choice" programs that allow students to take online, or even blended or in-person, courses from a much wider range of approved providers. In rural Louisiana, Winn Parish has historically had difficulties finding staff for Spanish and French courses, which students must take to be eligible for the state's public college scholarship program. Now students are taking online Spanish and French courses under the state's Course Access program.[27]

Importantly, personalized learning models that utilize technology can also help students engage with the broader community and gain exposure to new ideas.

Importantly, personalized learning models that utilize technology can also help students engage with the broader community and gain exposure to new ideas. For rural students who are geographically isolated and frequently come from low-income backgrounds, the costs of traveling outside of their community can be prohibitive. And the potential for direct exposure to a diverse spectrum of occupations and post-secondary opportunities may be diminished in rural settings.

Technology allows students to learn about professions that are less prevalent or nonexistent in their community; stay abreast of news in other countries in real time; and interact with peers who come from diverse racial, cultural, and religious backgrounds. Todd West, the principal of Deer Isle-Stonington High School, comments, "We are a tiny island off the coast of Maine. Not every resource will be a bus ride away. While there are great opportunities in our community, it's also helpful to connect our students to art museums in different places."[28] On the flip side, students in big cities can benefit by learning about the economic context, culture, and current-day realities of rural communities through increased communication with rural students.

Personalized learning has the potential to enable "anytime, anywhere" learning so that students have some instructional opportunities during which their presence is not required in the classroom. This is particularly important in areas where students must take very long bus rides to get to and from school.

In addition, personalized learning has the potential to enable "anytime, anywhere" learning so that students have some instructional opportunities during which their presence is not required in the classroom. This is particularly important in areas where students must take very long bus rides to get to and from school. Some reports indicate bus rides in rural communities ranging from 30 minutes to more than an hour each way.[29] As such, flexible learning environments can help address very pragmatic infrastructure challenges unique to rural areas. For example, if students can spend a certain proportion of the school week learning through online coursework, independent projects, or a community-based internship closer to home, they can reduce the total number of hours spent in transit between home and school.

"Flexible learning environment" does not always have to translate to a technology-based alternative. Rural schools can create low-tech or no-tech learning environments through partnerships in the community, which provide students with opportunities and leverage community connections. In Deer Isle, the marine pathway program includes field-based learning projects with local fishermen and boat builders, where students engage in hands-on learning outside of the school building. Internships or project-based learning can take advantage of community expertise and resources and could also be applied to addressing community challenges; they need not require a technology-based application.

3 Increased access to post-secondary learning can improve students' preparation, both academically and socio-emotionally, for college.

In rural areas, students don't always have sufficient opportunities to explore potential postsecondary pathways after high school. This challenge is exacerbated by the changing economy and stagnant job outcomes in many rural areas, where traditional industries have disappeared or play an increasingly diminished role. Bryan Hassel, co-director of Public Impact, an education research and consulting firm, notes, "In the rural context, you've got some students who finish high school and go into a career in their community. But some students will want to go to college or move elsewhere to pursue a career. It's not a simple matter of training kids to work for one big plant. Personalization becomes the imperative." While many rural schools already offer programs for students to engage in college coursework or workforce learning, a personalized learning strategy can bring these approaches to the next level. For example, individual learner profiles that keep track of academic progress, learning styles, and career aspirations can better equip teachers to identify specific needs, target instruction to maximize preparedness for post-secondary opportunities, and help students determine which post-secondary learning opportunities could be the most relevant and beneficial.

Increased exposure to college coursework can become part of a personalized learning framework as well. As schools begin to offer more specialized and advanced coursework, and as students begin to advance more readily under a competency-based approach, there will be a growing need to provide access to college-level coursework. Through dual

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> *-Superintendent Matt Akin*

enrollment programs—already popular in rural communities—students can earn college credit while still in high school by taking in-person courses at a local community college or university.[30] They may also take college-level coursework through online providers or comprehensive Course Choice programs. Piedmont City Schools in Alabama provides students with the flexibility to earn high school credit at the middle school level, and then college credit at the high school level. Superintendent Akin emphasizes, "The days when a high school diploma was enough are gone. If our students graduate high school with college credit, it gives them the sense that they can do college even if their parents didn't."[31] There's an economic factor to consider as well: By taking college coursework earlier, high school students may be able to lower the future costs of a college tuition by transferring their completed college credits.

By engaging in rigorous college-level coursework early, rural students also build the independence needed to succeed in college—critical given the low college matriculation and persistence rates in rural areas. One rural school district on the border of Utah and Wyoming has adopted a personalized learning model to build a sense of self-direction and independence among its students. Former superintendent James Bailey of Uinta County School District #1 notes: "We create a co-dependent environment in K–12 schools where teachers direct kids. If we don't give our kids opportunities for independence, they'll get to college and be lost."[32]

Rural schools can also introduce their students to possible career opportunities through project-based learning and internships. These approaches could link to a broader strategy to foster school and local industry partnerships. Students will be able to apply their classroom knowledge to a real-world setting and increase their workforce readiness. At the same time, local employers can help students develop the kinds of skills and competencies they want to see in future high school and college graduates.

4 By rethinking the roles of teachers and other educators, personalized learning can lead to more creative and effective human capital strategies for rural schools.

While students have the most to gain from a shift to personalized learning, schools and districts in rural areas can also benefit. Personalized learning can enable schools and districts, who continue to struggle with recruiting and hiring top teacher talent, to develop creative staffing strategies rather than relying exclusively on online and distance learning. Multiple instructional modalities commonly utilized in personalized learning models—direct instruction, small group, and tech-based learning—create opportunities to both extend the capacity, or "reach," of rural teachers and expand the range of teachers to which students and schools have access. Under a personalized learning model, the most effective teachers can actually serve a higher number of students if students spend part of their day in an online or blended learning environment. When using learning software, students often don't require intensive support from certified teachers. Instead, they can guide themselves in a self-directed manner or receive support from non-certified school

personnel such as paraprofessionals or community volunteers. These types of roles would supplement —not supplant—teachers. A more strategic deployment of certified teaching staff frees teachers to deliver instruction where their expertise and skills are essential to student learning, while other staff can monitor and support learning activities for which a teacher's expertise is less necessary. This strategy has financial benefits as well. Compared to certified teachers, the paraprofessional role is more cost-effective and easier to fill—this matters given how difficult it is for rural districts to attract talented teachers from beyond their community. "It's not about replacing teachers. But we could never afford all the teachers needed to meet our students' instructional needs," remarks Superintendent Akin from Piedmont City Schools.[33]

Leveraging multiple instructional modalities as part of a broader personalized learning approach can also help rural districts deal with human capital emergencies or sudden shifts in personnel in real time. Dell City Independent School District, which serves 100 students in Dell City, Texas, offers one illustrative example. After the district's only secondary social studies teacher left in the middle of the year, all students in the district enrolled in an online social studies class through the Texas Virtual Academy Network, the state's Course Access program.[34] Without this option in place, students may have faced gaps in their social studies learning or had multiple substitute teachers.

Current Barriers to Implementing Personalized Learning in Rural Schools

While applications of personalized learning in rural areas are promising, a path forward requires understanding current barriers in rural school systems and communities that could affect the future design and implementation of this type of model. Some of these barriers are also common in urban schools, while others are more pronounced or unique to the rural context.

Broadband Access and Infrastructure

In recent years, rural areas have made significant strides in increasing school access to wireless connectivity. The 2014 modernization of the federal E-rate program, which subsidizes telecommunications and internet costs in public schools, has played an instrumental role in improving school connectivity in high-need districts, including those in rural communities (see Sidebar 2, The Federal Communication Commission's Programs to Bridge the Digital Divide). As of 2015 rural students were as likely to be in school districts meeting federal bandwidth standards as their urban and suburban peers, according to national broadband advocacy group EducationSuperHighway.[35]

While many rural districts are currently meeting minimum broadband standards, as technology evolves, rural districts may not be able to keep up due to a lack of the more sophisticated fiber-optic cable.

While many rural districts are currently meeting minimum broadband standards, as technology evolves, rural districts may not be able to keep up due to a lack of the more sophisticated fiber-optic cable. Fiber-optic is the only technology considered fast and reliable enough to meet the quickly escalating bandwidth requirements for content

delivery (such as streaming video). Currently, 21 percent of rural districts lack fiber access compared to only five percent of urban districts (Figure 5). In Montana, where over a third of the students are rural, 35 percent of schools do not have the fiber infrastructure needed to meet bandwidth standards—the worst rate in the country.[36]

Sidebar 2

The Federal Communication Commission's Programs to Bridge the Digital Divide

The ability for schools and students to leverage technology to increase education options depends on schools' and families' access to the level of connectivity required to support that technology. True integration of educational technology requires access both in school and at home—a significant challenge in many rural communities that may lack technology infrastructure and may be underserved by internet service providers.

The Federal Communications Commission (FCC), the federal agency that regulates telecommunications infrastructure and service nationwide and whose mission is to ensure universal accessibility of communications services, operates programs to address the accessibility of high-speed broadband internet service. These programs help rural schools and communities access the infrastructure and services vital to full participation in an increasingly technology-dependent world.

The Telecommunications Act of 1996 formally extended the FCC's goal of universal service from its focus on telephone service to include high-speed internet for all consumers and established four grant programs targeted at increasing access specifically for rural consumers, low-income consumers, and facilities such as schools, libraries, and rural health care facilities.[i] [ii]

E-rate: Universal Service for Schools and Libraries

Of the four programs, the schools and libraries universal service support program, commonly referred to as the E-rate program, most directly supports education-related technology infrastructure in rural communities. E-rate provides funding to offset the cost of building and maintaining infrastructure to support telecommunications services and broadband internet service, as well as the cost of the services themselves. The level of funding available to applicants varies with the economic conditions of the community the school or library serves as well as its location in an urban or rural area.[iii]

Continued on next page

In recent years, the FCC adopted a set of funding and policy changes to the E-rate program, generally referred to as E-rate modernization. The FCC increased the overall funding cap for the program by $1.5 billion annually, an increase of over 60 percent. And the FCC also increased flexibility regarding how schools and libraries can use program funds to facilitate a range of options for building infrastructure and procuring services, including:

- Clarifying rules to better facilitate purchases through school consortia
- Increasing transparency so that schools and libraries can better compare rates offered by service providers
- Providing more options for financing and constructing fiber networks
- Better supporting schools' internal Wi-Fi needs

The FCC also set new benchmarks for connection speeds for the immediate and longer term that align with the requirements of modern technology-based applications.[iv] [v]

Connect America Fund and Lifeline

In addition to E-rate, two other FCC programs support the provision of broadband infrastructure in rural and remote communities and home access to broadband technology for low-income families. The Connect America Fund subsidizes telecommunications companies to provide infrastructure and service in rural and remote areas. The program aims to ensure universal access to broadband technology across the country and comparable rates for service across communities where little competition among carriers exists.[vi] [vii]

The FCC also recently revamped the Lifeline program, which subsidizes the cost of telecommunications services for low-income households, to move beyond voice service and to include the provision of high-speed broadband infrastructure and service. These changes are intended to allow low-income Americans equitable access to technology and to close the "homework gap" created when students cannot access information or technology required to complete schoolwork at home.[viii]

i "Universal Service," Federal Communications Commission, accessed March 4, 2016, https://www.fcc.gov/general/universal-service

ii "Contribution Methodology & Administrative Filings," Federal Communications Commission, accessed March 4, 2016, https://www.fcc.gov/general/contribution-methodology-administrative-filings

iii "E-Rate—Schools & Libraries USF Program," U.S. Federal Communications Commission, accessed March 4, 2016, https://www.fcc.gov/general/e-rate-schools-libraries-usf-program

iv Benjamin Herold and Sean Cavanagh, "E-Rate Undergoing Major Budget, Policy Upgrades: K–12 Digital Demand Fuels Modernization," Education Week, January 26, 2015, accessed April 4, 2016, http://www.edweek.org/ew/articles/2015/01/07/e-rate-undergoing-mEajor-policy-budget-upgrades.html

v FCC, Second Report and Order and Order on Reconsideration in the Matter of Modernizing the E-Rate Program for Schools and Libraries and the Connect America Fund (FCC 14-189), December 11, 2014: 1–5.

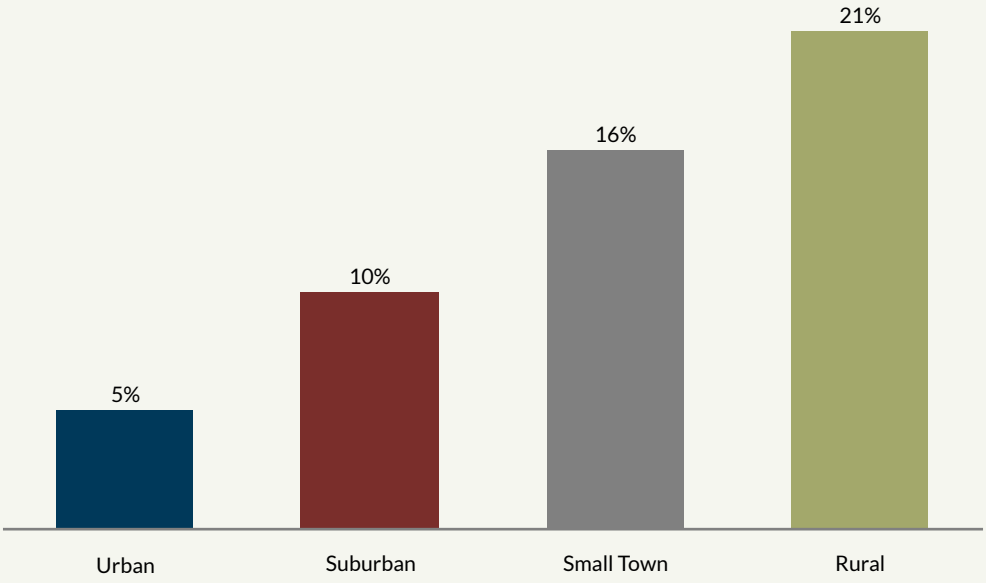
vi Grant Gross, "FCC Vote to End Telephone Subsidies, Shift to Broadband," PC World, October 27, 2011, accessed April 6, 2016, http://www.pcworld.com/article/242713/fcc_votes_to_end_telephone_subsidies_shift_to_broadband.html

vii "Wireline Competition Bureau Universal Service Implementation Report: WC Docket No.: 10-90," FCC, March 18, 2014: 1–5, accessed April 6, 2016, https://apps.fcc.gov/edocs_public/attachmatch/DOC-326217A1.pdf

viii FCC, "FCC Modernizes Lifeline Program for the Digital Age: New Rules Will Help Make Broadband More Affordable for Low-Income Americans," March 31, 2016, accessed April 4, 2016, https://www.fcc.gov/document/fcc-modernizes-lifeline-program-digital-age

The biggest barrier to building out fiber infrastructure for rural schools is the lack of service providers. Because national carriers typically avoid serving rural areas, school districts have to rely on local internet providers who face little competition and can charge higher rates than in more competitive markets.[37] According to a 2015 nationally representative survey from the Consortium for School Networking, 54 percent of rural district leaders reported only one internet service provider in their area.[38] The cost of fiber construction is also prohibitive for many rural providers, who do not see enough demand from the community to justify the upfront investment.[39] "The challenge for rural America is the future. If we don't get affordable fiber out to those communities, they're going to get left behind," observes Evan Marwell, EducationSuperHighway's CEO.[40] For rural schools without adequate broadband access and technology infrastructure, the potential for personalized learning to dramatically shift the teaching and learning experience is limited.

Figure 5 Prevalence of Public Schools Lacking Fiber Connections by Geographic Locale



Source: EducationSuperHighway

Another challenge is that the provisions of E-rate—a large-scale national program—may not go far enough to acknowledge the specific barriers rural districts may face. As just one example, districts are expected to contribute matching funds if they receive E-rate support—but rural and low-income districts often do not have adequate resources to do so.[41] According to *The Anniston Star*, 91 districts in Alabama, or about two-thirds of all districts in the state, aren't able to raise the required matching funds to secure E-rate funding.[42]

Improving internet access in schools also doesn't address the connectivity challenges students face at home. Based on 2015 data from the Pew Research Center, only 55 percent of rural residents have broadband access at home compared to the national average of 67 percent.[43] Without continued internet access after leaving school, rural students have challenges completing their homework or engaging in online instruction or other types of off-campus learning. While the lack of internet access is also a barrier in urban homes, particularly low-income ones, students living in cities have more options for getting online away from school. In densely populated areas, there are more community "hotspots" that offer free internet access—especially in places where families and students naturally gather, such as the local library or YMCA.[44]

Staff Capacity and Change Management

The staff capacity required to design and implement personalized learning is significant. In rural districts with small central offices, educators at the school level are the ones most likely to shoulder these responsibilities.

The staff capacity required to design and implement personalized learning is significant. Schools and districts need to ensure that new models are aligned to curriculum and academic standards, procure effective products and software, and identify ways to assess the competencies students need to demonstrate to progress to the next level in their coursework. In rural districts with small central offices, educators at the school level are the ones most likely to shoulder these responsibilities. Given that schools already face staffing shortages, these new responsibilities can be daunting for teachers—perhaps more so than in urban districts where central office staff can provide operational and instructional support for personalized learning.

Another staff-related challenge relates to who can actually provide instruction in rural schools. In the face of significant staffing shortages, rural schools sometimes want or need to leverage the time and expertise of adults who aren't formally certified teachers. But under the previous federal No Child Left Behind law, there was little flexibility around who could and couldn't be a teacher of record. Non-certified adults who could guide student learning during internships, project-based learning opportunities, or digital learning time could not act as official teaching figures for students. While this is a challenge for many districts regardless of geography, it is especially pronounced in rural schools that depend on the valuable instruction and feedback non-certified teachers can provide to students.

A less tangible barrier is navigating resistance to change within schools and the broader community. Personalized learning can entail a transition away from traditional bell

Without awareness and authentic buy-in from school leaders and teachers, personalized learning approaches will likely not take hold.

schedules, a redesign of the physical classroom layout, and new expectations for the teacher role. With flexible learning pathways, students may have more opportunities to engage in learning outside of the school walls—potentially leading to shifts in the on-campus community and culture. Without awareness and authentic buy-in from school leaders and teachers, personalized learning approaches will likely not take hold.

Perceptions among the broader community matter as well. Keara Duggan, director of design and implementation at Education Elements—which provides technical assistance to schools implementing personalized learning—observes: "Many rural families have attended the same schools for generations, and we've seen some pushback from parents who don't understand why school is changing for their kids."[45] Duggan acknowledges that gaining buy-in for personalized learning in large cities can be challenging as well. However, she notes that the connectedness of rural areas—while clearly an enormous asset for these communities—can also make initiating change more difficult when traditional structures and roles are deeply entrenched in the culture of a place.[46]

John Fischer, currently a senior program officer at the Bill & Melinda Gates Foundation, echoes Duggan's sentiments. While working at the Vermont Agency of Education to help the state implement policies conducive to personalized learning, he consistently faced challenges in gaining public support. He reflects, "For 10 years in Vermont, there was pushback from small schools, teachers, and unions who felt that technology would eliminate teachers. … Or they would worry their school would be closed if students chose more pathways outside the traditional school building."[47] Making a case for the need for change and for engaging in the hard work of implementing a new instructional model to both the school staff and the broader community emerged as common components of the process of implementing personalized learning among the schools consulted for this report. And while those school leaders indicated strong community support for change—whether driven by poor student outcomes or engagement, or recognition of poor economic prospects for graduates—in each case, community voices were included early in implementation.

School and District Accountability

As personalized learning models have started to take hold, districts—including non-rural ones—have consistently cited current accountability systems as a pain point. Under a standards-based accountability approach, which was core to the previous federal No Child Left Behind law and remains the default model under its replacement, the Every Student Succeeds Act, students and schools are evaluated primarily based on whether they meet common grade-level expectations on annual state assessments. This approach of evaluating students aligns poorly with personalized learning models that emphasize flexible pathways. Under flexible pathways, students can demonstrate knowledge in a multitude of ways, which don't necessarily fit with standardized tests. Additionally, personalized learning calls for competency-based progression where students advance based on mastery of content

at their own pace, which may be faster or slower than the traditional one-grade-per-school-year structure. As a result, the progress of learning under a personalized model can match poorly with a system of standardized summative assessments of content that students are "supposed" to learn in a given school year. Instead, personalized learning models advance students in a fluid manner by utilizing formative assessments—enabled by the use of adaptive learning software in real time—and performance-based assessments,[48] which are particularly important for learning that takes place outside of the classroom. As Karen Cator, CEO of Digital Promise, notes, "Although we have a lot more capacity to understand more about student learning, policies still favor standardized tests to the detriment of all other information."[49]

State accountability systems also evaluate schools based on students' proficiency toward grade-level expectations, which doesn't fully capture the academic progress of students who start out far behind grade level. These are the very students who can reap significant benefits from a personalized learning approach that tailors instruction to a student's starting point and learning style. When all students have to take the same grade-level assessments, students who are very behind academically may not have an opportunity to show they've made significant academic growth. On the flip side, students who are more advanced cannot show the full range of their academic capabilities on a state test that only includes content calibrated to their grade level.

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Funding Constraints

Funding constraints affect all districts, but they can be particularly challenging for rural districts. With the bulk of funding flowing to schools based on the number of students served, small rural districts can be disadvantaged. And small class sizes resulting from small student populations and other diseconomies of scale in rural communities drive higher costs. Prescriptive state and federal policies that impose limitations or requirements on how funds must be spent can exacerbate these constraints. And while many districts can choose to levy additional property taxes locally to fund new initiatives, in rural areas where poverty rates are high and property values are often low, increasing tax rates may not be palatable to local voters or may not generate sufficient revenue to justify an increase.

Anecdotal evidence suggests that some rural districts are adept at stretching dollars —such as having personnel perform multiple functions. But even with creative fiscal management, many rural schools find little room in school budgets to implement new initiatives, requiring school leaders and communities to contemplate difficult trade-offs in spending. These constraints prove challenging in implementing a new personalized learning model, which requires significant up-front investments in personnel and resources.

Though these barriers are not insurmountable, as demonstrated by the schools profiled for this report, policymakers and education leaders can create conditions more favorable to supporting innovation through personalized learning.

Recommendations for Policymakers

To enable the growth of personalized learning in rural areas, state and local policymakers can explore a number of strategies:

1 Ensure rural districts leverage new broadband opportunities, particularly those under E-rate, by developing state grant programs and fostering partnerships between districts and service providers.

To ensure that rural schools will be able to fully leverage E-rate funding, state policymakers can designate funds to help districts pay for their expected match. In its 2016 regular session, the Alabama Legislature enacted the Alabama Ahead Act to allocate state grants to districts seeking to improve their wireless technology. Under the law, districts will be able to apply for grants to cover the matching funds they must contribute to leverage E-rate dollars. Districts that already have appropriate broadband infrastructure can still access these funds to buy devices or pay off existing debt toward wireless infrastructure purchases.[50]

When small local service providers lack the capacity to offer this service to schools, rural districts may have no other option but to shoulder the financial burden themselves and build their own fiber networks. States can provide funding to help cover these one-time fiber construction costs.

Many rural districts also need to upgrade to fiber infrastructure, the only technology that can scale quickly enough to meet evolving connectivity needs of most schools.[51] When small local service providers lack the capacity to offer this service to schools, rural districts may have no other option but to shoulder the financial burden themselves and build their own fiber networks. States can provide funding to help cover these one-time fiber construction costs. In California the state's 2014–15 budget established the Broadband Infrastructure

Improvement Grant program to support network connectivity in eligible schools. The state solicited fiber construction bids from service providers through a Request for Proposal (RFP) process—and, thus far, 171 schools have been selected for upgrades.[52]

States can also help ensure that rural districts leverage new opportunities under E-rate to construct their own fiber networks. In recognition of the burden that rural districts face, the FCC removed the historical cap on the amount of E-rate funding that can be allocated toward "special construction" costs—such as building fiber networks. Through funding year 2018, districts won't face an annual limit on the amount of E-rate funds they can use to construct their own fiber connections, provided they can show they don't have any affordable alternatives through local providers.[53] States can provide guidance to rural districts that choose to build their own fiber networks by helping them develop an RFP process, and by connecting districts to service providers in the state who have expressed an interest in building fiber networks in rural areas.

2 Develop creative solutions at the district level to ensure that students have internet access outside of school.

Even with better broadband infrastructure in place, districts and schools still need to consider how students will access the internet at home in order to fully leverage technology-based and flexible learning opportunities. In rural communities, creating a select number of community wireless hotspots won't be as effective a strategy as it is in densely populated cities. Instead, students need mobile solutions that allow them to access the internet even when they are far away from school or community hubs. One strategy is for rural districts to loan out mobile hotspot devices for the school year. Piedmont City Schools in Alabama offers Verizon MiFi hotspots to students at a discounted rate of $15 per month.[54]

Other districts have upgraded their school buses to be wireless-enabled so that students have internet access during long bus rides to and from school, and so that the buses themselves can act as community hotspots. Eminence Independent Schools, a 700-student school district in rural Kentucky, parks wireless-enabled school buses in low-income apartment complexes in the evening.[55] And in southern California, Coachella Valley Unified School District sends out school buses equipped with wireless routers to various neighborhoods where students live. For students living farther out in very rural areas, the district will allow them to check out mobile hotspots. "Connectivity should not stop at the school door. ... We want to move our students into the category of 'haves' from 'have nots' with our technology initiatives," emphasizes Coachella superintendent Darryl Adams.[56]

Other districts have upgraded their school buses to be wireless-enabled so that students have internet access during long bus rides to and from school, and so that the buses themselves can act as community hotspots.

And schools can ensure that low-income families in rural communities are aware of subsidies available through the FCC's Lifeline program to offset the cost of high-speed home internet connections (see sidebar, The Federal Communication Commission's Programs to Bridge the Digital Divide).

3 Form rural consortia so that multiple school districts can share or pool resources.

Districts can take these partnerships one step further and share instructional tools, professional development, or even human capital resources focused on personalized learning.

Many rural districts face financial challenges due to their small size and issues of scale. For example, a district that has multiple bus routes to reach the families it serves may not have each bus filled to capacity. To address these challenges, many school districts in rural communities are sharing financial, administrative, or instructional services through partnerships or consortium agreements. To build their capacity to launch personalized learning, districts can take these partnerships one step further and share instructional tools, professional development, or even human capital resources focused on personalized learning.

The New England Secondary Schools Consortium (NESSC) offers one such example. NESSC includes nearly 500 secondary schools in Maine, Vermont, New Hampshire, Rhode Island, and Connecticut that seek to improve graduation rates, increase college-readiness, and close achievement gaps. With support from the Next Generation Learning Challenges, 20 of these schools are in the process of launching personalized learning models.[57] By sharing a resource bank of online tools, participating in regional conferences, and hosting site visits, these early adopters are committed to leveraging one another's best practices—and sharing lessons learned with other NESSC member schools.[58] "A lot of teachers might only be familiar with one school structure and way of teaching. As part of NESSC, our staff see there are other small rural schools like us in the Northeast in communities with declining populations. These schools have come up with things that worked—it helps us see the possibilities," notes Todd West, the principal of Deer Isle-Stonington High School in Maine.[59]

A consortium can also be more competitive for federal and state grant opportunities relative to a single district, particularly a small rural one. In 2013 a group of rural Appalachian districts known as the Ohio Appalachian Collaborative received a $15 million grant to expand the use of technology in the classroom.[60] By implementing both a blended learning and a dual-enrollment approach with local colleges, participating schools are increasing student access to college-level coursework.[61] State policymakers can encourage districts to form similar consortia through financial inducements or other types of incentives. For instance, districts that apply together for a state grant can receive additional points on their grant application if they articulate a compelling strategy for how they plan to partner together.

In addition to achieving practical outcomes, consortia help rural districts create networks of moral support. Exploring school-level innovation requires significant leadership and vision. Mark Kostin from the Great Schools Partnership—which leads NESSC—emphasizes, "If you have a network and can use examples from a context similar to yours, it becomes less lonely and compels you to stay the course longer."

4 Create more local flexibility for districts to make changes to traditional staffing structures.

Existing policies around teacher certification or class size requirements can be problematic in two ways: They rarely acknowledge the unique difficulties rural schools face around human capital, and they don't foster the growth of personalized learning models that redesign staffing patterns and student groupings.

For personalized learning to take hold in rural communities, policymakers should provide districts with more autonomy to develop creative staffing structures.

For personalized learning to take hold in rural communities, policymakers should provide districts with more autonomy to develop creative staffing structures. One way states could accomplish this is by developing a waiver policy that allows districts with a clear rationale or unique constraints to have autonomy from certain staffing or class size policies. With autonomy from traditional credentialing policies, schools can better leverage adults who provide valuable instructional guidance—but who may not have a teaching certification—to students. Consider, for instance, a local employer guiding a student internship or a paraprofessional monitoring students during online learning time. And with greater flexibility around class size policies, rural school leaders can be more creative about how they group students during the school day, and make changes in a more fluid manner depending on students' needs.

5 Leverage opportunities under the new federal education law to develop innovative forms of assessment aligned to personalized learning.

The recent passage of ESSA creates a new opportunity for states to explore alternative accountability mechanisms to evaluate schools. States can now incorporate academic growth measures and computer adaptive tests into assessment and accountability systems.[62] ESSA also created a new program called the Innovative Assessment pilot program, which will fund up to seven states or consortia of states to develop competency-based assessment systems.[63]

States with large rural student populations could use these opportunities to develop assessment models that are more aligned not only to personalized learning models, but also to the unique needs of rural schools. States could follow the example of Idaho and Iowa, which have both developed statewide task forces around implementing competency-based education.[64]

These efforts should include input from rural educators, particularly those implementing personalized learning, for feedback on the types of indicators used to measure student outcomes; pain points they face under current accountability practices; and recommendations for developing accountability systems based on high expectations and rigorous standards that are better aligned to rural contexts and personalized learning.

Recommendations for Rural School and District Leadership

The look and feel of personalized learning models will vary across the rural context. However, among rural school and district leaders interviewed for this paper, a few common themes and recommendations emerged.

Rather than taking on personalized learning because it's the "new and shiny" trend within education innovation, rural practitioners should articulate achievable objectives for this work.

1 Have a clear rationale for adopting personalized learning.

Before implementing personalized learning, school and district leaders should consider the challenges they currently face and the ways that personalized learning will help them address specific gaps. Rather than taking on personalized learning because it's the "new and shiny" trend within education innovation, rural practitioners should articulate achievable objectives for this work. For instance, they may want to increase the percent of students who have access to college coursework within five years, achieve faster student academic growth on state assessments, or increase students' learning opportunities with local employers.

2 Engage the broader community on the ways in which personalized learning can support student learning and community needs.

Rural practitioners should carefully consider how to approach getting buy-in from educators and families of the students they serve. Policy change alone may not shift people's perceptions or lead to broader change management. Even if parents believe that personalized learning could open up opportunities for their children, they may feel resistant to the potential costs or tradeoffs involved in implementing a new instructional model.

Keara Duggan at Education Elements observes, "Because rural communities tend to be much more connected, people are very aware when tradeoffs are made—if part of a school's budget has to be reallocated from field trips toward purchasing devices, parents notice. There needs to be a clear vision for why a school is moving in the direction of personalized learning and why it is an important investment of time and resources."[65]

One way to gain community buy-in is to tie student learning to a local community's economic and workforce needs. NESSC's Mark Kostin believes that Deer Isle-Stonington High School has made great progress in developing a shared economic vision with the broader Deer Isle community. "The community was concerned with economic sustainability, and that's where they found common ground. People were saying, 'We need to make sure kids are not just prepped to become lobstermen, but also to run their own lobster businesses.'" Todd West, who leads the personalized learning efforts at Deer Isle-Stonington, reflects, "The vision of what people wanted for our school was often best held by parents and community partners. We made sure to engage them from the start."[66] To develop the learning pathways—including the one on marine studies—at his school, West formed design teams that included teachers and community leader partners. Parents and students were also invited to design meetings to provide their input.

3 Support teachers in their work to implement personalized learning while also providing them with ample ownership.

Because personalized learning is still a new concept in rural communities, teachers will need significant support to learn about and implement personalized learning. Schools and districts should think about ways to provide additional professional development, whether that's through an increase in the actual hours or days of professional development or through more flexibility around the types of professional development opportunities teachers can leverage.

In addition to providing high-quality training, districts can create new coaching or leadership roles for teachers who are especially committed to personalized learning. Uinta County School District #1 in Wyoming created two new roles to support its personalized learning efforts in recent years. A "blended learning coach," who previously taught middle school English in the district, now works full time to support blended learning implementation across the district. And within each school there are "blended learning leads," current classroom teachers who lead school-wide trainings and one-on-one coaching sessions with their peers to help them adopt blended learning models.

While a centralized support system for teachers can help foster the growth of personalized learning, teachers should also have autonomy to customize their personalized learning strategy to achieve their specific objectives.

While a centralized support system for teachers can help foster the growth of personalized learning, teachers should also have autonomy to customize their personalized learning strategy to achieve their specific objectives. Akin, the superintendent of Piedmont City Schools, notes, "We provide the structure—a rotational model, for example—but then give teachers the flexibility to design within that structure."[67] Because personalized learning is a framework, rather than a prescriptive method, it can look quite different across subjects, grade levels, and communities. By providing teachers with ownership over this work and the time to do it, schools and districts can help maximize the potential for authentic staff buy-in and for personalized learning to most effectively meet students' needs.

Conclusion

Some common components of personalized learning models—particularly online or distance learning—have long been part of rural schools' strategies for expanding opportunities for students. But few rural schools fully leverage a personalized learning model that integrates all its core components and reimagines the overall instructional approach. Though personalized learning is not a panacea to the educational challenges of rural districts, early research from urban districts where personalized learning has a longer track record shows promise in advancing student achievement and addressing many of the challenges common to urban and rural schools around achievement gaps and student engagement. Plus, some of the features of personalized learning, such as flexible staffing and learning environments, could address some persistent practical challenges many rural schools face around human capital and infrastructure.

But to be successful at implementing personalized learning, rural educators and communities must fully understand and support fundamental changes to instructional delivery and embrace the opportunity to radically alter what school looks like for students. All of the school leaders implementing personalized learning in rural schools who are highlighted in this report emphasized that these changes are hard and require tremendous commitment from staff. School and district leaders must invest significant resources in supporting teachers as they implement a model customized to the needs of students that may be very different from the way they are accustomed to delivering or even thinking about instruction.

States can support these innovations by creating and supporting collaborative efforts among rural schools and districts, both to share experiences and pool resources. And states can offer other supports through infrastructure investments to allow for full integration of technology-based tools in schools and in students' homes and by enabling flexible staffing and scheduling to ease the realization of personalized learning models.

Rural schools are no strangers to innovation. The realities of limited budgets, human capital constraints, and challenging geographies can breed creative problem-solving in small, tight-knit communities. In this way, the flexible and adaptable nature of personalized learning, which ideally molds to fit the student rather than asking the student to fit the school, reflects the self-determined ethos of the rural character itself, underscoring what can be possible for rural students and communities.

Early Rural Adopters of Personalized Learning

Case Study: Uinta County School District #1, Wyoming

Uinta County School District #1 (UCSD #1) is located in southwest Wyoming and serves about 2,800 students, 45 percent of whom are eligible for free or reduced-price lunch.[68] The district comprises eight schools, including four elementary schools, two middle schools, one senior high school, and one combined alternative junior and senior high school.[69] The district reported revenues of about $17,300 per student for the 2011–12 school year.

- 8 schools serving 2,854 students
- 46 percent of students are eligible for free or reduced price lunch

Background and Impetus for Adopting Personalized Learning

Over a period of several years, evidence amassed that students in Uinta were neither thriving in the K–12 school system nor achieving postsecondary success. According to district leaders, Wyoming's state accountability system showed that students weren't achieving academic growth at expected levels, and among those who attended college, persistence rates were low. Former superintendent John Bailey points out that Wyoming has few in-state institutions of higher education, requiring students to compete for out-of-state slots in four-year colleges and to contemplate going far from home for college. These conditions make college a more costly and daunting prospect for students and families. But the local economy, largely based in the energy industry, is suffering from price fluctuations in that market, which limits job opportunities within the community.

At the same time, district leadership realized that UCSD #1 was not integrating technology into the classroom effectively, although access to technology infrastructure and devices was prevalent. Wyoming is unusual in that the state provides high-speed broadband to

schools. And UCSD #1 had invested significantly in hardware, including laptops and tablets for students. What the district lacked, however, was a strategic vision for how technology could be used to improve students' educational experiences.

Recognizing the technological assets of the district and the big challenges faced by its students, district leaders began exploring personalized learning with two goals in mind:

- Increase the level and pace of growth in student achievement
- Help students become more self-determined, a skill set school leaders believed would enable UCSD #1's graduates to be more successful in college

Implementation Strategy for Personalized Learning Model

Partnering with Education Elements, a private consulting firm that supports schools implementing personalized learning, Uinta began with an in-service presentation to the entire staff to demonstrate blended learning models and spent several weeks promoting and educating staff on the potential for integrating technology to serve students. Following that effort, the district announced a four-year roll-out plan for personalized learning and allowed interested teachers to opt in. Implementation began in spring 2013 with a cohort of 56 of the district's 256 teachers across elementary, middle, and high school grades. Education Elements trained these year-one teachers that spring and summer, while school leaders engaged in community outreach, educating parents and generating buy-in for the transition to a new instructional model.

Since that first cohort, teachers have led the design of personalized learning models for their classrooms based on the needs of their students and with support from personalized learning coaches in each school building. Building-level coaches and lead teachers run the program and own the process.

Key Lessons and Challenges

Personalized learning must be defined beyond technology.

Early in implementation, teachers were primarily defining personalized learning as the integration of technology, but not thinking much beyond that aspect. In an effort to move to a more holistic view of personalized learning, after the first year, the district took a group to the iNACOL conference to learn and engage in a process of defining personalized learning for themselves. As a group they came up with an "Innovation Configuration" based on four elements of personalized learning: small group instruction, use of integrated digital tools, data-driven decision-making, and student reflection and goal setting. They collectively determined that the presence of these four elements constituted a personalized learning space.

Instructional design must be centered on students and not tools.
In the early days, the focus was on choosing the model first and developing instruction around it. District leaders realized that they needed instead to start by identifying the specific challenge that students or teachers were facing, such as lack of student motivation, and then develop the instructional model around addressing that challenge.

The district needs to select and support the right digital tools.
Choosing effective digital tools has also been a challenge. In the first year, the district hosted a vendor fair and allowed teachers to select any products they wanted, resulting in a patchwork of products across the district that was difficult to support. In the second year, the district narrowed the choices to a defined set of foundational and supplemental products, while still allowing teachers to make a case for separate products based on student needs and learning objectives. Despite this more streamlined approach, product selection remains a problem. Former superintendent Bailey cited a lack of research-backed resources and the lack of tools well suited for secondary schools as particularly difficult barriers.

The Future of Personalized Learning in Uinta

Uinta is still in the midst of its four-year roll-out plan, with more teachers adopting personalized learning each year. So far, the district hasn't seen significant improvements on student growth outcomes on state assessments or the NWEA, but it is early. And both designing for and measuring improvement on the other primary goal, students' independence and self-direction, remains a work in progress.

Early Rural Adopters of Personalized Learning

Case Study: Piedmont City Schools, Alabama

Located in northern Alabama near the Alabama-Georgia state line, Piedmont City School District serves about 1,200 students in three schools (an elementary, a middle, and a high school). About two-thirds of Piedmont's students are eligible for free and reduced-price lunch, and the district reported total revenues of $8,534 per student for the 2011–12 school year.[70] [71]

- 3 schools serving 1,235 students
- 61 percent of students are eligible for free or reduced price lunch

Background and Impetus for Adopting Personalized Learning

Led by a superintendent with a background in computer technology and a technology director whose foresight had resulted in smart infrastructure decisions, Piedmont was poised to successfully shift to a one-to-one student-to-device model. Technology-based instruction was being used narrowly in the district, primarily to remediate students off track for graduation. And faced with a specific human capital challenge resulting from the loss of a foreign language teacher, Piedmont began experimenting with online learning options as a means to provide students' access to a broader array of course options. After seeing success with that effort, district leaders began exploring ways that technology could be integrated in the regular instructional program and extended beyond remediation to meet a broader set of instructional needs, particularly where the district faced the human capital constraints of a small, rural district.

The key goal for implementing personalized learning in Piedmont is to produce 1.5 years of learning gains per year for students. The bigger picture aim is to expand opportunities for students after high school so that Piedmont students have access to the same opportunities

as students in larger communities, like nearby Huntsville. And with limited local job prospects for high school graduates, school leaders hope the program will enable students to engage in more dual enrollment and other post-secondary opportunities earlier, both to demonstrate to the students themselves that they are fully capable of college-level work and to make college more affordable.

Implementation Strategy for Personalized Learning Model

Piedmont students had long been engaged in project-based learning, using devices to connect to research and experts in the fields they were studying, but one challenge the district faced was connectivity at home. The Piedmont community has a high poverty rate, and home access to high-speed broadband is not universal. The district focused on solving this issue—initially leveraging federal grant funds to provide home access. When that grant ended, the district participated in a federal E-rate pilot program to partner with the city to build a wireless network throughout the city and to fund Verizon MiFi cards for students outside the network. The Verizon model emerged as the more cost effective for the long term, and currently the district provides MiFi devices to students for a low monthly fee. Superintendent Matt Akin cites the expansion of home broadband access as a key turning point in implementing personalized learning.

Piedmont opted to start its personalized learning implementation in middle school to take advantage of prior training and experience among middle school teachers with small group instruction, which was lacking among high school teachers. Piedmont allows teachers to drive the specifics of implementation of personalized learning in their classrooms. So the exact model looks different from classroom to classroom, and the district provides support with release time for professional development based on the teacher's assessment of development needs.

As the district gains experience with the model, it is being integrated into elementary and high school grades on a cohort basis. Though personalized learning is not fully implemented across the district, some common elements are present even where true personalized learning is not yet happening. For instance, all high school students currently take at least one online course, and the high school schedule has been modified to accommodate the implementation of personalized learning. Opening up the school schedule has enabled the high school to offer six-week mini-courses in topics such as hunter safety that engage students and foster their connection with the school.

Key Lessons and Challenges

Assessment requirements pose an ongoing challenge to competency-based progression. Early in implementation, like many districts interested in personalized learning models, Piedmont struggled with seat time requirements. A change in state policy has eased that struggle, but state assessment requirements still pose a challenge. Students in Piedmont's personalized learning environments progress through their studies based on competency and not according to a schedule, which creates potential misalignment between what students are actually studying and traditional grade-level assessments. With a stated goal of accelerating learning beyond a single year's learning gain, the program goals are inherently misaligned with the current assessment structure.

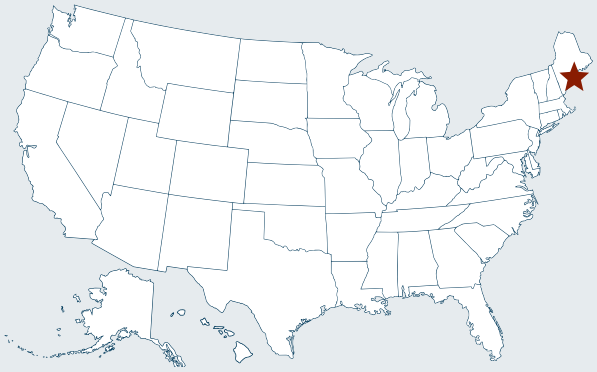
Buy-in is essential for personalized learning in the school and the larger community. Superintendent Akin emphasized that even with teacher buy-in, personalized learning is hard to implement and requires a tremendous commitment from staff. School leaders must articulate a clear rationale and goal for transitioning to a personalized learning model and provide teachers with sufficient support in revamping instructional practices. And community engagement has been a critical part of the implementation of personalized learning. Superintendent Akin indicated that while rural parents want the best for their kids, there may be reluctance to do anything perceived as encouraging students to leave the community after graduation. Easing these worries among Piedmont families has required emphasizing the bleak economic reality of Piedmont for many students, as well as highlighting the potential that improved educational outcomes and opportunities represent for students and for the community.

Early Rural Adopters of Personalized Learning

Case Study: Deer Isle-Stonington County School District, Maine

Deer Isle-Stonington CSD serves just over 300 students in two schools (grades K to 12) located on the coast of Maine. With about 40 percent of all students eligible for free or reduced-price lunch, Deer Isle-Stonington reported total revenues of $22,361 per student for the 2011–12 school year.[72]

- 2 schools serving 323 students
- 38 percent of students are eligible for free or reduced price lunch



Background and Impetus for Adopting Personalized Learning

In the early 2000s, Deer Isle-Stonington High School struggled with graduation rates among the lowest in the state—just 57 percent in 2009, down from a historical trend that had hovered in the 70 percent range. And the dropout rate was high, with students leaving to work in the lucrative fishing industry. Deer Isle-Stonington CSD is an isolated rural district on the coast of Maine seated in a community that has a long history in the fishing industry, where people have traditionally been able to make a good living without extensive formal education. School leaders felt that many students failed to see much relevance in what they were learning in school, and the community began expressing a sense that the high school was failing to provide value to students, families, and taxpayers.

Todd West, a relatively new principal at the time, was discouraged by progress under a traditional comprehensive high school model. In spite of hard work among the 16 teachers in the school, they weren't seeing dramatic gains. Looking around, they saw strengths in the community—a fishing industry that brought values and skills, a vibrant arts community, and inquisitive and hard-working students whose talents weren't being tapped in the school setting. Working with the community, the school decided to change its approach and implement a personalized learning model.

They wanted every student to graduate prepared for college or career and have a lifelong-learning mindset. And they were willing to change anything about school and instruction that needed changing to help students move closer to those goals.

Implementation Strategy for Personalized Learning Model

Step one in the implementation process involved showing staff what was possible in a rural school. By participating in the NESSC's high school redesign conference, school staff saw other small rural schools serving similar student populations doing innovative things. Those models helped Deer Isle-Stonington's teachers gain a vision of what was possible and an understanding of how it could work in a small school setting.

Deer Isle-Stonington's chosen model depends on learning "pathways" that focus on curriculum, project-based and community-based learning opportunities, and student performance evaluation around a central unifying topic that crosses subject areas. Currently, the district has implemented a marine studies and an arts pathway, tapping into community resources, and plans to implement a health care pathway down the line. The development of each pathway was supported by a core design team comprising teachers and community partners who also engaged parents and students. Pathways teachers received stipends for additional professional development and support from instructional coaches with expertise in personalized and proficiency-based learning. Coaching time was used for curriculum design, instruction in developing project-based learning models, and classroom management strategies adapted to flexible and field-based learning environments. In addition to professional development and support embedded in the school year, the school hosted five-day summer institutes and retained support from the facilitators of those sessions through the school year.

Technology, a mainstay of many personalized learning models, does not feature prominently in the Deer Isle-Stonington model at this time. Software-based learning supports foreign language instruction and remediation and credit recovery. But to date, technology is not an integrated part of the personalized approach, in spite of the school being a one-to-one school where all students have had iPads for several years. While Principal West certainly sees the potential for technology in accessing broader resources—particularly given the school's remote location—the school's capacity to support an integrated approach to technology hasn't allowed it to take hold.

Deer Isle-Stonington's personalized learning model is just a few years into implementation, and Principal West isn't thinking about next steps yet. He wants to see success with their model first. He points to progress during high school of the most recent graduating class, whose early indicators (NWEA and the 10th-grade PSAT) were grim. Though that class graduated with the lowest state test scores in five years, West indicates that compared to where they were, they

achieved remarkable growth. And he cites the retention of students who indicated in middle school that they planned to drop out at 16. Graduation rates are up significantly—91 percent in 2013. And dropouts have fallen from 17 in 2009 to three in 2013.

Though there is still work to be done, West indicates that from listening to stories—students and parents reporting higher levels of engagement and seeing real relevance in their education—he feels that progress is being made.

Key Lessons and Challenges

Staff capacity has been and remains a significant challenge in a small, remote school.
The biggest challenge to implementing a personalized learning model in Deer Isle-Stonington has been staff capacity. With only 16 teachers on staff and the isolated and remote nature of the community, accessing support and recruiting qualified teachers to fill vacancies is a significant challenge. The nearest college is more than an hour away, and the nearest high school is a private school half an hour away. Implementing a new instructional model is a huge undertaking for any staff, much less one so small and with limited access to resources.

Complex public grant processes create barriers for small districts in cultivating resources to support implementation.
For a school with a central office of three people, onerous grant requirements pose a challenge and are one reason why Deer Isle-Stonington has opted to pursue private, rather than public government grants. Since the requirements for implementation and reporting for most state and federal grants are the same regardless of school or district size, the value of the time and effort required to apply for grants and support reporting outweighs the level of financial support provided.

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