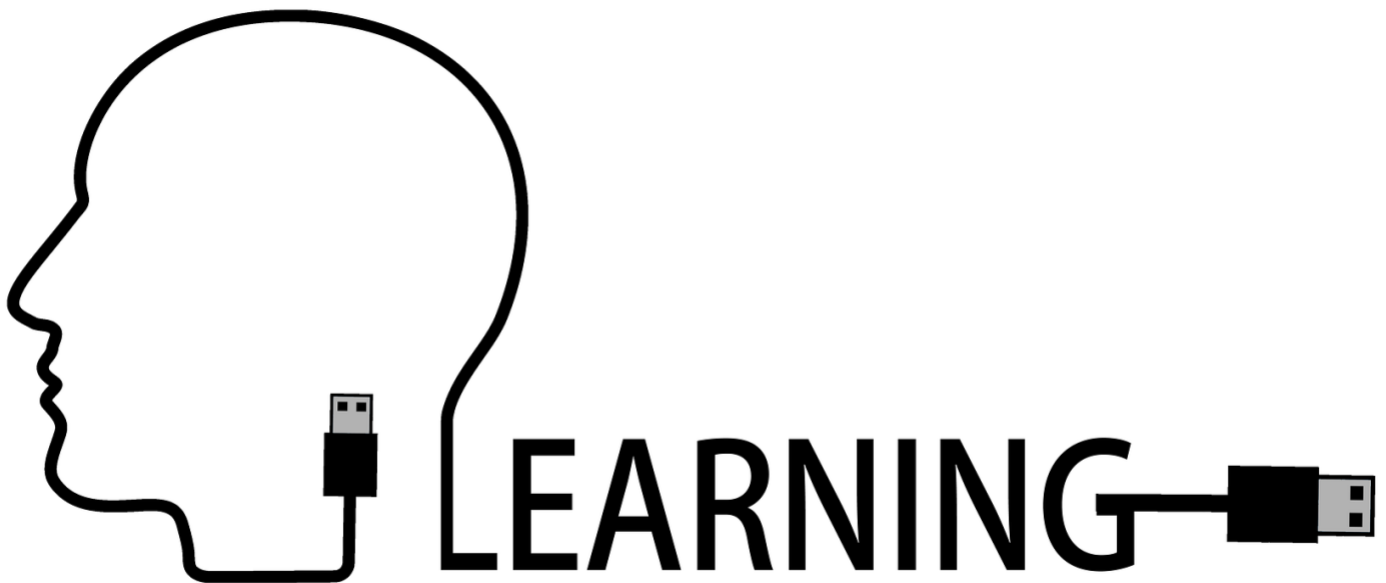# Best Practices for Using Data in Personalized Learning

LEARNING

# Chapter 1: Personalized Learning in Schools, Districts, and States

## Introduction

Educators employ different methods of teaching and learning to help their students succeed. One such method is personalized learning, which aims to tailor instruction to the needs, talents, and skills of each individual learner. Rapid advances in technology platforms and digital content over the last decade have enabled more widespread use of personalized learning. As a result, many schools and districts may be interested in expanding its use across various content areas and grade levels. Effective personalized learning requires the collection, understanding, and use of data across many variables. Schools and districts that are interested in implementing personalized learning need to be prepared to ensure the data access, data privacy, and time and training to use data that are necessary to making personalized learning scalable.

This document is designed to assist education agencies as they consider whether and how to expand their use of personalized learning. It provides an overview of personalized learning and describes best practices used by education agencies to collect data for personalized learning; to use those data to meet personalized

> This document is intended for those districts and states that may be interested in personalized learning.

learning goals; and to support the relationships, resources, and systems needed for effective use of data in personalized learning. It also provides a particular focus on data considerations needed by different locations depending on their approach to personalized learning, and considers questions such as which data elements are appropriate at the district or state levels. Because personalized learning is still a developing prospect in many locations, the concepts and examples provided here are intended to help facilitate idea sharing and discussion.

## Defining Personalized Learning

Many leading educators and researchers have contributed to recent conversations about personalized learning, yet there is no single, agreed-upon definition of the practice. Definitions from various organizations include several common elements, but may vary in specificity and explanation. This document will use the definition provided by the U.S. Department of Education's Office of Educational Technology (2017):

> Personalized learning refers to instruction in which the pace of learning and the instructional approach are optimized for the needs of each learner. Learning objectives, instructional approaches, and instructional content (and its sequencing) may all vary based on learner needs. In addition, learning activities are meaningful and relevant to learners, driven by their interests, and often self-initiated.

Beyond having varying definitions, districts and states also vary considerably in how they put their concepts of personalized learning into practice. As the examples in this resource will show, personalized learning programs across the United States vary from individual projects completed outside the classroom to full-scale implementation of individualized learning plans and assessment of mastery either within classrooms or systemwide. In addition, some locations have statewide personalized learning endeavors (e.g., Vermont), while others either have district-based programs or are developing programs that feature either initial pilot districts or state-level support for particular personalized learning tasks. For example, Utah currently has a pilot program of 13 districts that are incorporating personalized learning and mastery-based assessment into their larger digital learning plans, whereas Idaho offers assistance to students through personalized online courses and to districts via support for content and infrastructure. Finally, there is wide variation in the grade levels targeted by personalized learning programs across the country: some focus specifically on elementary or middle school, some offer personalized plans in high school aimed at preparation for postsecondary options, and some allow personalized learning approaches or projects across all grade levels. At this point, there is wide variation in how states and districts are designing and implementing personalized learning, and their choices often reflect the nature of their size, location, and funding options.

## What Personalized Learning Is Not

When defining personalized learning, it is important to clarify what it is not. Personalized learning does not, for example, necessarily require all students to have their own device (e.g., a tablet), nor does it equate to isolated learning. Schools can incorporate many personalized learning tasks without having a vast number of devices, and students should engage in collaborative activities with peers as well as individual tasks (Rhode Island Office of Innovation 2017). Additionally, personalized learning does not leave students to learn without guidance or to "teach themselves." While responsibility for one's learning and self-guided tasks are goals of personalized learning, the teacher's role remains central (Pane et al. 2015). In fact, the ongoing guidance and feedback in this approach mean that many students will have more one-on-one time with their teachers than in a traditional classroom model.

> Personalized learning does *not* require all students to have their own devices.

> Personalized learning does *not* mean learning in isolation.

Perhaps most importantly, personalized learning does not require technology. Educational technology does not equal personalized learning, but technology is a tool to facilitate and enable personalized learning. It can provide teachers and students with expanded options for accessing and learning information, as well as varied ways of reaching and demonstrating mastery of content. Additionally, recent advances in technology have allowed many states and districts to bring personalized learning to scale in ways that were not previously possible. Figure 1 describes what personalized learning is not.

> Technology is a tool to *facilitate* and *enable* personalized learning.

**PERSONALIZED LEARNING...**

Personalized learning aims to tailor instruction to the needs, talents, and skills of each individual

✔ does *not* require all students to have their own devices;

✔ does *not* mean isolated learning;

✔ does *not* mean that students are "teaching themselves";

✔ does *not* disconnect students and teachers;

✔ does *not* mean educational technology.

Figure 1. Personalized learning

## Key Terms in Personalized Learning*

Attendance – Attendance in an instructional program approved by the school, district, and/or state (National Forum on Education Statistics 2018).

Competencies – Systems of instruction, assessment, grading, and academic reporting that are based on students demonstrating that they have learned the knowledge and skills they are expected to learn as they progress through their education.

Data-Informed – Determined by data rather than set schedules or prior experiences. In personalized learning, data about students' knowledge, interests, and progress are used to help determine their needs and design their learning activities.

Digital Content – Information available for download or distribution on electronic media, which may be digitally broadcast, streamed, or contained in computer files.

Digital Learning – Learning facilitated by technology that gives students some element of control over time, place, path, and/or pace.

Experiential Learning – Learning that occurs through experience, with a specific focus on learning through one's reflection on those experiences.

Formative Data – Data collected from a range of formal and informal assessment procedures conducted by teachers during the learning process in order to adjust teaching and learning activities to better meet student needs.

Individualized Learning – Instruction and learning designed to meet the unique pacing of each student. Academic goals remain the same for the class or group, but individual students can progress through the curriculum at different speeds, based on their own particular learning needs.

Learner Profile – A detailed summary of data relevant to an individual student's personalized learning, such as academic history, particular interests and skills, and personal motivations for learning.

Learning Objectives – Brief statements that describe expectations for student learning (including content, skills, and activities) within a given span of time.

Mastery – Demonstrating comprehensive knowledge of content or skill in a particular area.

Mastery-Based Learning – Instruction and assessment focused on the demonstration of knowledge of content, without adherence to traditional instructional schedules. Mastery may be demonstrated in varied ways and at different times by individual students.

Performance Assessment – Observing a demonstration of knowledge acquired, skills gained, or readiness to move to new content.

Student-Centered – Based on the needs and interests of the student. Student-centered learning focuses primarily on the activities of the student rather than those of the teacher.

Sustainability – The ability to be maintained at a certain rate or level. In education, this typically refers to a program or initiative maintaining the funding, resources, and overall support needed to continue.

Tailored Instruction – Instruction specifically designed to meet the needs of each student. Teachers may differentiate content, learning processes, the learning environment, or student groupings to best address varying levels of knowledge, skills, and needs.

*Note that this is not a comprehensive list.

# Chapter 2: Key Concepts for Personalized Learning

The different paths some states and districts have taken in their development of personalized learning plans mean that they may have different specific needs in terms of resources and materials to support their efforts. However, educators and researchers focusing on personalized learning consistently highlight several key concepts, including

- instruction and content tailored to student needs;
- a focus on content mastery;
- the use of data-informed, real-time feedback; and
- effective use of technology.

Within each of these areas, schools and districts select data elements to facilitate the collection and strategic use of student information.

## Tailored Instruction

Within a personalized learning model, instruction includes rich learning experiences intended to accelerate and deepen student learning, and the teacher's role is to design and manage the learning environment in order to provide students with expert guidance and support, helping them take increasing ownership of their learning (Pane, Steiner, Baird, and Hamilton 2015). Individualizing content may include matching components of instruction to students' particular interests and experiences (Walkington 2013).

### Tailored Instruction in Practice

Team Yellowstone, a "school within a school" in Sacajawea Middle School in Bozeman, Montana, changed from the traditional school schedule to longer blocks for core subjects, which allow students to investigate subjects of interest and work with peers in project-based learning. Students also focus on core subjects during a particular part of the year (e.g., social studies in the fall and science in the spring), which allows time for deeper study.

Personalized learning is supported by instructional materials that are flexible enough to meet the varying needs of students over time. These materials are complemented by targeted instruction that aligns to specific student needs and learning goals. Teachers may move among different teaching methods and strategies, such as small group, one-to-one, or whole group discussion, depending on changing needs (Johns and Wolking n.d.).

As teachers tailor instruction, they may use both formal and informal means of gathering information and identifying student needs. Formal structures such as assessments or scheduled observations provide important information, but teachers also draw significant amounts of information from conversations and direct interactions with students. The relationship between teacher and student is critical to tailoring instruction: teachers need to remain cognizant of their students' achievements and challenges, as well as their varying needs across time.

## Learner Profiles

In order to optimize learning experiences and classroom activities for each student, a teacher needs detailed knowledge of their needs, strengths, interests, and mastery of different competencies. Many teachers collect and maintain information for tailored instruction by creating learner profiles for their students that help track and analyze student data across multiple variables. These variables can include individual learning information such as learning history, potential barriers to learning (e.g., personal or emotional issues), and academic supports currently in place, such as individualized education programs (IEPs). Profiles may also include the student's academic status; information about particular learning strengths and skills; and particular motivators for learning. Depending on the location, the learner profile might be tracked and updated via a spreadsheet, online application, or dashboard. Each profile is established by the teacher and the student, so that it best represents the student's goals and specific learning data. This co-creation also allows the profiles to be tools in students' ownership of their learning.

As part of a Statewide Personalized Learning Initiative launched in 2016, Rhode Island implemented learner profiles for students. These profiles provided a framework for personalized learning plans, and they helped teachers create plans to close learning gaps, support students in exploring learning objectives at a deeper level or at an accelerated rate, and help students plan for college or a career (Rhode Island Office of Innovation 2017).

> "You can't motivate a kid you don't know."
> ~ teachers' motto at Montana's Team Yellowstone

Learner profiles are also used in schools where personalized learning may be centered on particular projects rather than general classroom time, such as in Connecticut's Meriden School District. In Meriden, students develop proposals for personalized learning experiences that allow them to pursue areas of personal interest and potentially work with professionals or mentors in that area. These projects are monitored by teachers who have volunteered to work with the personalized learning activities, who work with the students to develop projects that challenge them and meet requirements under state standards. These teachers also coordinate with Personalized Learning Coordinators at the schools, as they work together to meet individual student needs while maintaining academic rigor.

## Vermont's Learner Profiles

As part of the state's Personalized Learning Plans (PLP), teachers in Vermont work with students to compile key information across different areas related to learning and help them develop their PLP. While districts are given the flexibility to specifically define how these plans are developed and structured, state leaders provide a set of critical elements to consider to help guide educators in their work. These critical elements are summarized below:

### Plan Information
- Student name and student ID
- Name of school
- Date of initial plan development
- Dates of each update and/or ensuing meetings
- Participants in each development meeting listed [e.g., student, family member or advocate, advisor/mentor, core teacher(s), etc.]

### Student Profile
- Student strengths, abilities, and skills
- Student core values
- Baseline assessments results

### Student Goals
- Secondary school goals
- Post-secondary goals

### Action Steps
- Student goals action steps
- Post-secondary goals action steps

### Achievement of Action Steps
- Progress toward meeting student goals
- Progress toward meeting common learning expectations and goals (as a means to measure student growth, achievement of action steps, and goal attainment)
- Assessments could include baseline assessment results, evidence of student learning, benchmark assessments, performance assessment, self-assessment, peer assessment, formative assessments

### Reflection
- Student self-evaluations
- Parent/guardian reflection
- Teacher/advisor(s) reflection

### Revision
- Documentation of the revision process including edits, amendments, improvements, alterations, etc.; correspondence of revisions with reflections, etc.
- Once revisions are finalized the following would be included in the goals and action steps: updated short-term and long-term goals; updated action steps; transition plan (if applicable)

## Content Mastery

In addition to individualized content and flexible instruction methods, personalized learning models tend to incorporate different means of assessment of student knowledge and progress than those used in traditional classroom models. Many plans focus on students' mastery of content, in which students demonstrate comprehensive knowledge of content or skills in a particular area to indicate their academic progress. This is in contrast to the traditional, time-bound content progression, in which lessons have a set schedule and length of time and all students move on together to learn new content despite differences in mastery.

A focus on mastery of content, rather than strict instructional timelines, provides students greater ownership of their own learning, as well as more choices in their learning processes. For example, some teachers allow students to choose how they want to demonstrate mastery of a given concept or subject—for example, the choice between writing an essay or building a model—or to choose to explore a particular topic at a deeper level or for an extended period of time. To facilitate student engagement, teachers can construct personalized learning environments in which students are given ownership over some aspects of their learning. They can also support students as they develop and practice habits of success, allowing the students to increasingly monitor their own progress (Rhode Island Office of Innovation 2017).

## Data-Informed, Real-Time Feedback

Effective use of data provides the foundation for learning to be individualized: teachers and students know where the student is in terms of understanding content, mastering skills, and meeting educational goals. Meaningful data collection and use gives teachers a more complete understanding of their students' progress, and allows them to use the technology and tools available to craft lessons and experiences specific to their students' needs (Data Quality Campaign 2016). Frequent data collection about students' comprehension and mastery of content, as well as their learning goals and experiences, provides a basis for instructional decisions and effective grouping of students. Formative data (that is, data collected during the learning process) allow teachers to identify trends and areas that need improvement, and to modify their instruction to meet specific needs of students (Johns and Wolking n.d.).

Educators should meet frequently within instructional data teams to review information and make decisions about individual student needs; use data to provide immediate, targeted feedback to students; and use regular formative assessments to inform instruction (Johns and Wolking n.d.). In Ohio's Forest Hills School District, for example, teacher teams work together to analyze data about individual students, make instructional and intervention decisions, and plan useful learning experiences. At a higher level, teachers and administrators may work with data analysts or evaluators to assess and discuss aggregated data, in order to make decisions at the school or district level. Similarly, district leaders work with data experts at the state level, who offer data analytics and feedback to guide decisionmaking, as well as other types of training and guidance. These feedback loops provide a continuing flow of data that inform and facilitate personalized learning.

In many districts, students also have access to their data and an understanding of how to use the data to set and work toward learning goals. With data about

> **Focusing on Student Data**
>
> Working with data is critical even in smaller personalized learning endeavors. In Bozeman, Montana's Sacajawea Middle School, the two teachers of Team Yellowstone have daily discussions about classroom data for the program's 60 students; these discussions inform students' goal setting and teachers' instruction.

their progress over time, students can see the areas or skills that require more time and attention, and this knowledge allows them to take more ownership of their learning (Data Quality Campaign 2017). They are encouraged to work with their teachers in using their data to understand their progress, plan for their upcoming tasks, and work toward further mastery. Data provide students the chance to reflect upon their learning, identifying the successes and challenges that then inform their goal-setting and choices.

A focus on student comprehension and use of data can be seen in Minnesota's Personalized Learning Plans (PLPs), in which high school students are required to develop plans for their future goals, which may include higher education and/or the workforce. Each student's individual data profile includes information about their academic knowledge and skills, personal learning styles, and options for the future. It also includes data on experiential learning opportunities they may have had, such as site visits, job shadowing, mentoring, or internships.

Districts and charter schools may also purchase programs that allow students to develop their PLPs. These systems may also allow them to research information about colleges, occupations, funding, and other areas that may affect their future plans. Students use all of this varied information to develop a personalized plan for their future, with the support of teachers and administrative staff.

> "Kids are highly motivated by data that are meaningful to them."
> ~ perspective from data leaders in Westminster Public Schools (Colorado)

## Effective Use of Technology

Teachers have long known that students vary in their skills, talents, and educational needs, and have designed and modified their practice in various ways to best serve their students. Until recently, however, these teachers have made these adjustments and varied their methods largely on their own, without specific support from administrators or targeted tools and resources (Digital Promise 2016).

Technology now allows meaningful personalization based on more specific and ongoing data about the learner (Digital Promise 2016). New technologies, as well as advancing methods of data collection and use, enable teachers to quickly see the progress of each student on various tasks and lessons, and to provide differentiated feedback and formative assessments (Rhode Island Office of Innovation 2017). For example, personalized learning is enabled by smart e-learning systems, which help continually track and manage students' learning needs. These systems also provide a platform to access the dynamic learning content, resources, and learning opportunities needed to meet widely varying student needs (Wolf 2010).

**Using Technology to Enhance Personalized Learning**

Technology can help teachers

- assess students' strengths, needs, and expanding mastery;
- select, manage, and deliver curriculum;
- provide students access to targeted resources; and
- use e-learning management systems to track learning needs of students and classrooms.

Offering students opportunities to use preferred technology can also increase student engagement. Because many students use a wide range of emerging technologies outside of school to support their learning, their classroom work might be encouraged and facilitated by the chance to use these technologies during the school day (Project Tomorrow 2012).

Finally, recent technology has allowed personalized learning to be brought to scale on a level that was not previously possible. While technology can play a key role in delivering and supporting instruction, it also enables educators to collect and analyze the sometimes complex, detailed data needed to support personalized learning. Educators may have multiple means of recording, sharing, and analyzing data, as well as then offering feedback to students or colleagues.

**Managing Multiple Platforms**

The vast array of technologies available to support personalized learning means that educators may be working with multiple applications and service providers. Managing the increasing role of private providers is an important governance consideration for states and districts.

# Chapter 3: Personalized Learning Data

The collection and use of meaningful data are integral to the programs discussed throughout this document. Data about individual students and their learning activities allow teachers to see the trajectory of progress across different academic competencies and assess students' levels of mastery of information or skills. These data also allow teachers to make plans appropriate to the particular needs and skills of the students, and data can be used for both short- and long-term planning of lessons and other educational activities.

Data also allow schools, districts, and states to assess the needs, challenges, and successes of personalized learning plans. By asking targeted questions and collecting the data needed to answer them, education leaders can see what is working and what needs to be adjusted, assess how to distribute resources or education staff, and determine future needs (fiscal and otherwise).

## Categories of Personalized Learning Data Elements

Data associated with personalized learning can be categorized into the following six major areas:

- Program structure and design
- Curriculum and instruction
- Student learning objectives
- Mastery and competencies
- Support systems
- Budget and finance

Table 1 lists each category and provides examples of the types of questions that might be addressed from related data.

| Categories of Personalized Learning Data | Related Data | Examples of Questions That Might Be Addressed From Related Data |
|---|---|---|
| Program Structure and Design | • Calendars<br>• Schedules<br>• Task Leads<br>• Assigned Responsibilities<br>• Enrollment | • What is the schedule for implementation?<br>• When will specific tasks be completed?<br>• Who is responsible for particular tasks or activities? |
| Curriculum and Instruction | • Academic Content<br>• Curricula<br>• Instructional Models<br>• Class Plans | • What specific content will students address?<br>• How will the content be delivered?<br>• What will the teacher role be in various activities? |
| Student Learning Objectives | • Learner Profiles<br>• Academic Targets<br>• Personalized Plans for Activities | • What are the goals for each individual student?<br>• Which data elements are in a given student's learner profile?<br>• What are the intended means to meet these objectives?<br>• What is the student's progress toward individual goals, as well as state standards? |
| Mastery and Competencies | • Competencies<br>• Mastery Frameworks<br>• Mastery Levels<br>• Assessment<br>• Portfolio Reviews<br>• Graduation Requirements | • How will students show mastery of particular content?<br>• What are the competency levels in different areas of learning material? |
| Support Systems | • Metadata<br>• Training<br>• Professional Development<br>• Personalized Learning Coaching<br>• Parental Engagement | • How will the varied aspects of the agency's overall plan for personalized learning be supported?<br>• How will teachers be supported?<br>• How will parents and other stakeholders be engaged? |
| Budget and Finance | • Budget Information<br>• Local and State Funding<br>• Grant Funding | • What is the funding structure?<br>• How does it break down among local, state, or grant funding?<br>• How are particular program elements funded? |

Table 1. Categories of personalized learning data elements, related data, and example questions that might be addressed

## Structured and Unstructured Data in Personalized Learning

An additional consideration in data collection and use for personalized learning is the difference between structured and unstructured data, and the variations in how each are used. The term *structured data* generally refers to data that can be collected via a learning management system, such as student, course, or curricular data (Gudivada 2017). The term is used to refer to information with a high degree of organization, so the data are easy to store and search within a relational database (one that is structured to recognize relationships among stored items of information) (BrightPlanet 2012). *Unstructured data* refers to data that are not structured via predefined data models or schema. Unstructured data may include text or non-text data, and may be either human or machine generated (Taylor 2017). Within personalized learning, unstructured data could include communications between teachers and students, or among student teams; they could also include teacher observations of students' reactions to classroom activities or interactions with others. This information can be used in real time to tailor instruction.

In addition to differences in the nature of these two types of data, analysis of structured data tends to be simpler than that of unstructured data, based on the greater organization and easier searchability of structured data. More advanced analytics tools exist for structured data, whereas those for unstructured data are newer and less developed (Taylor 2017). However, analysis of unstructured data for personalized learning may hold great promise, as it may reveal more about individual students' behaviors and ways of thinking that provide important insights related to those students' understanding of content. As education data teams work toward more sophisticated methods of data analysis for personalized learning programs, they are likely to expand upon the possibilities for using these two types of data, and to explore the potential for analyses that integrate the two.

## Considerations for Personalized Learning Data

In addition to understanding the categories and types of data used for personalized learning, there are several other data-related considerations that may be relevant for educators at various levels. Schools, districts, and states should have existing data governance processes and procedures in place for all data collection, use, and reporting. These agencies need to consider how personalized learning data, which may be different from other data, will adhere to these processes and procedures. Questions to consider include the following:

- Who has access to various types and levels of data, and for what purposes?
- What data will be collected that are specific to individual students, and how will personally identifiable information (PII) be protected?[1]
- Which data are primarily for individual learning support and teacher/student interactions, and which are primarily for program evaluation and improvement? How and when are these two categories connected?
- At what levels will the data be aggregated and for what purposes?
- How do personalized learning data fit into established data reporting structures? If new structures are needed, how will the data be reported to different audiences and/or for different purposes?

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[1] For more information, see resources available from the U.S. Department of Education's Privacy Technical Assistance Center (https://studentprivacy.ed.gov/). In addition, see chapter 4 of this resource for a more extended discussion of data privacy.

# Chapter 4: Strategies to Support Personalized Learning

## Create a Strategic Plan

If educators and leaders are planning to use personalized learning, it is important to first define expectations and goals for the program and have discussions about how success and challenges will be defined and measured. Practical elements must be clarified and planned as well. Needs assessments can identify the resources already in place, as well as what types of investments will be necessary—whether in terms of personnel, training, technology, or other tools.

As education agencies consider using personalized learning, they should establish measurable goals, have clear plans for collecting and managing data, and define timelines and expectations. Although many locations have transitioned into personalized learning in a piecemeal fashion, those that have been the most effective (and able to sustain their efforts across time) have been those who engaged in deep discussion and careful mapping of the plans beforehand. Questions to ask when developing a personalized learning plan include the following:

- Who will perform which tasks, and when?
- Is the agency's plan for moving into personalized learning designed to increase gradually or in steps, and if so, what will these specific steps be?
- What data currently exist in the data system, and what additional data will need to be collected?
- At what rate are expansions of the plan expected to happen?
- What types of assessment will be implemented, both for individual student progress and for the initiative overall?
- How will teachers determine when a student's personalized learning goals are achieved?
- What level of training may be needed for teachers prior to the program, and what kind of mentoring or coaching may be needed as the effort is implemented?

### Needs Assessment

It is critical that schools and districts that are planning to implement personalized learning have clear goals and plans for developing needed resources and tools. Teachers have indicated that they often face struggles in three areas when integrating technology into their lessons: executive issues, such as managerial or financial problems; infrastructure problems, such as technological or physical challenges; and instructional concerns, such as inadequate materials or underdeveloped teacher competencies (Vatanartiran and Karadeniz 2015). Education agencies need to be ready to recognize and address these challenges in order to move forward successfully. When developing resources for an educational shift such as introducing personalized learning, schools and districts commonly go through a three-phase plan of needs assessment, resource building, and resource implementation (see figure 2).

Figure 2. Needs assessment process

*Needs assessment* is a process through which an organization defines its specific needs. "Needs" can be understood as the gap between the organization's current environment and its desired environment (National Forum on Education Statistics 2005). The assessment identifies gaps in resources and capabilities based on numbers and types of stakeholders, existing knowledge or materials, prior training, current technology, and other categories relevant to the particular change or transition.

In addition to identifying gaps in needs, the needs assessment process can help a state or district

- determine priorities and allocate potentially limited resources;
- align goals, strategies, and outcomes (for example, by making sure the personalized learning project aligns with the agency's strategic plan);
- provide direction and tools for the program; and
- enable monitoring of the program as it is implemented (O'Reilly 2016).

In the *resource building* phase, an education agency moves forward with the information gained from the needs assessment and begins to collect the resources necessary to meet identified gaps. Resource building may involve working through required financial processes for obtaining and purchasing new technology, software, or curricular materials; or it may involve a process of identifying and arranging appropriate training or professional development options. Throughout this phase, instructional teams, administrators, and technology experts need to stay in close contact to ensure that resources for the transition are being designed and prepared in ways that align with the intended project goals.

In the *resource implementation* phase, the agency moves forward with putting the transition in action, and thus implementing those resources identified by the needs assessment and developed during resource building. During this time, the school or district moves through the designated steps of the plan, and will collect data and make assessments as resources are introduced and integrated into classrooms. This allows them to review feedback from stakeholders and make adjustments where needed.

## Modify Infrastructure and Learning Environments to Support Personalized Learning

While personalized learning does not require technology, most modern personalized learning plans do include technological options, as well as data systems to collect and analyze personalized learning data. Therefore school systems should have the infrastructure in place to support these parts of the process. When used effectively, data enable teachers to see a fuller picture of their students' progress and adjust lessons and learning tasks accordingly (Data Quality Campaign 2016). School and district leaders can support teachers' use of data by providing the data tools and systems to facilitate data use, as well as restructuring learning environments to minimize data burdens (i.e., collecting, managing, and reporting data) and allow teachers to focus on instruction and scaffolding lessons (Bill and Melinda Gates Foundation 2015). They can provide further support by vetting and choosing personalized learning systems, devices, and tools, as well as providing high-quality materials, curricula, and assessments aligned with personalized learning goals (Rhode Island Office of Innovation 2017). Leaders need to provide guidance and support to ensure that teachers understand and see the value in data, and are knowledgeable about how different types of data (such as individual student data vs. aggregate data) will be used.

Part of this restructuring also includes providing the training, professional development, and classroom support needed for teachers to become skilled as they incorporate personalized learning into their teaching. Ohio's Mason City School District, for example, provides teachers with specific professional pathways for personalized learning, and has them work with personalized learning coaches and participate in professional development opportunities to work with colleagues and expand upon what they have learned. In Ohio's Forest Hills School District, leaders have created a districtwide shared curriculum, encouraged teachers to explore how students can meet standards, and provided instructional coaches. In Vermont, a personalized learning working group, made up of a variety of different stakeholders, has developed resources and guidelines for teachers and schools, provides ongoing guidance, and offers collection mechanisms for personalized learning data.

Developing the competencies needed to successfully provide and support these programs takes time. School leaders can best support their staff by thinking strategically about the roles different stakeholders play in the process, and considering creative transitions such as new staffing models and more flexible learning environments (Rhode Island Office of Innovation 2017).
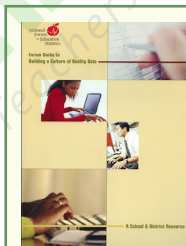
## Data Systems

A critical part of creating an infrastructure that supports personalized learning is ensuring that data systems can capture personalized learning data. As states and districts create and expand their personalized learning programs, they need to consider how personalized learning data collected will or will not be entered, housed, and utilized within their data systems. Education leaders should discuss what personalized

The National Forum on Education Statistics resource *Forum Guide to Building a Culture of Quality Data* (https://nces.ed.gov/pubsearch/pubsinfo.asp?pubid=2005801) provides additional guidance relevant to modifying existing structures and systems.

learning data they plan to collect, intentions for their use, and potential relationships among these data and the data currently collected in that location (this could include both student academic data and standard district- or state-level compliance data). The issue of interoperability is particularly important: data should be able to move accurately and effectively between applications in order for teachers to receive and use data to successfully meet student needs.

*Interoperability* refers to the seamless, secure, and controlled exchange of data between applications.

(Project Unicorn 2018)

States and districts vary in the level to which they are integrating personalized learning data into their student information systems (SIS). Many are still working with stakeholders to determine the full scope of data that will be collected, and plan to move from there to clarify how these data can be included in their current systems. Others are leaving the responsibility for and control over personalized learning data to individual teachers—allowing them to use

these data for learner profiles and educational planning—without plans to then move the data up to data systems at the school, district, or state level. (In some of these cases, teachers do report student progress based on mastery- or competency-based assessments.) Some districts do work with personalized learning data at the district level, but have often faced challenges. Ohio's Forest Hills School District, for example, found that as the nature and complexity of the data collected for personalized learning grew, they needed to upgrade and expand their system to one that was more dynamic and able to meet higher-level needs.

Connecticut's Meriden School District has faced obstacles when students' personal learning projects have continued into the summer, making it difficult to incorporate the related data into the system for that school year. Overall, the current state of personalized learning data and agencies' data systems is in flux in many locations, as leaders continue to clarify program details and learning goals.

Data collected for assessment of personalized learning do not always fit easily into existing data systems. Data systems that are set up to record numerical data, such as assessment scores or letter grades, may not be able to accommodate new types of data collected as part of personalized learning. For example, Ohio's Mason City School District allows students to provide artifacts related to their experiences outside the classroom, such as photos of museum visits or photo collages of service work completed. These items are considered evidence of learning, but do not lend themselves to typical data assessment. These data from the district's "Personal Learning Days" are not logged into the SIS. Similarly, Team Yellowstone at Sacajawea Middle School, in Bozeman, Montana, has been able to incorporate student engagement survey data into the school's SIS, but the data they collect from project-based learning tasks or mini-conferences with students continue to be used at the classroom level and are not entered into the larger school system.

Use of student data also depends on the nature of personalized learning efforts in a given location. In Utah, pilot districts in the state's Digital Teaching and Learning Grants program are navigating the transition to competency-based assessment and moving from letter grades to competency scales (in which students' efforts are rated 1-4). This switch to competencies has also included a shift in course requirements at the middle school level: students can take types of courses (provided they earn a specified number of math credits) and move through the material at the rate at which they reach and can demonstrate mastery over the content. This is an important shift from students being required to take a particular sequence of courses in a given subject. It has also required the state to consider the issue of equivalencies: that is, how to switch between competency ratings and grades if a student moves in or out of a pilot district and a transcript needs to be evaluated. This question of credit and transcript transfer has come up for many districts and states working with personalized learning and mastery-based assessments.

In one part of its personalized learning efforts, Idaho tracks and transforms student data using a mastery-based badging system called SkillStack, in which students who have demonstrated mastery of particular content can earn related badges. These badges can then equal university credit in a subject or equate to completion of a career and technical education (CTE) competency.

## Plan for the Sustainability of Personalized Learning

The ways in which states and districts fund personalized learning programs and activities vary considerably. Funding streams differ, as do the particular needs of each agency. Education leaders need to consider their particular needs in terms of technology, professional development and training, resources, and other supports—and assess how these needs align with their fiscal options. Additionally, policies and regulations influencing the continuing sustainability of education initiatives vary among states and districts, and need to be considered and integrated as appropriate when transitioning to personalized learning.

### Financial Sustainability

The states and districts highlighted in this resource have developed different approaches for funding personalized learning efforts. Forest Hills School District draws funds from the general fund curriculum budget. Idaho has a mixed funding model that combines state funds (about 65 percent) with funding from the districts that are users of the Idaho Digital Learning Academy. In Vermont, Flexible Pathways Education Fund Grants are appropriated each year that support districts in their implementation of personalized, proficiency-based learning, and the state has also received intermittent grant funds to support state-level parts of the personalized learning plan. The districts in Utah's pilot program receive grants through the Digital Teaching and Learning Grant Program, created and funded by the state legislature. Connecticut's Meriden School District received a grant from the Nellie Mae Foundation to fund its efforts. Across these different locations, the nature and source of funding has both been driven by and influenced the scale and type of personalized learning program that has been developed.

The Office of Educational Technology (OET) at the U.S. Department of Education offers a set of fundamental questions states and districts should consider when financing digital learning (which can often be a component of modern personalized learning; see figure 3):

- What resources are presently available in schools, and how are they distributed?
- What are the 1-, 3-, and 5-year goals in terms of digital learning?
- What devices do students already bring to school? How do they use those devices?
- How fast are the internal and external connections in schools? How fast must they be to meet students' and educators' needs?
- What are the major strengths and challenges this area has in terms of technology?

**DIGITAL LEARNING**

is any instructional practice that effectively uses technology to strengthen a student's learning experience.

**PERSONALIZED LEARNING**

is instruction in which the pace of learning and instructional approach are optimized for the needs of each learner.

*Digital Learning Without Personalized Learning*

Modern technology, such as devices for each student, can be incorporated into classrooms in which teachers do not use personalized learning.

*Personalized Learning With a Digital Learning Component*

Personalized learning can occur in classrooms where teachers and students use technology, such as devices for each student, as tools to facilitate learning.

*Personalized Learning Without a Digital Learning Component*

Personalized learning can occur in classrooms where teachers and students use mainly nontechnological resources such as physical books, paper, materials, and supplies.
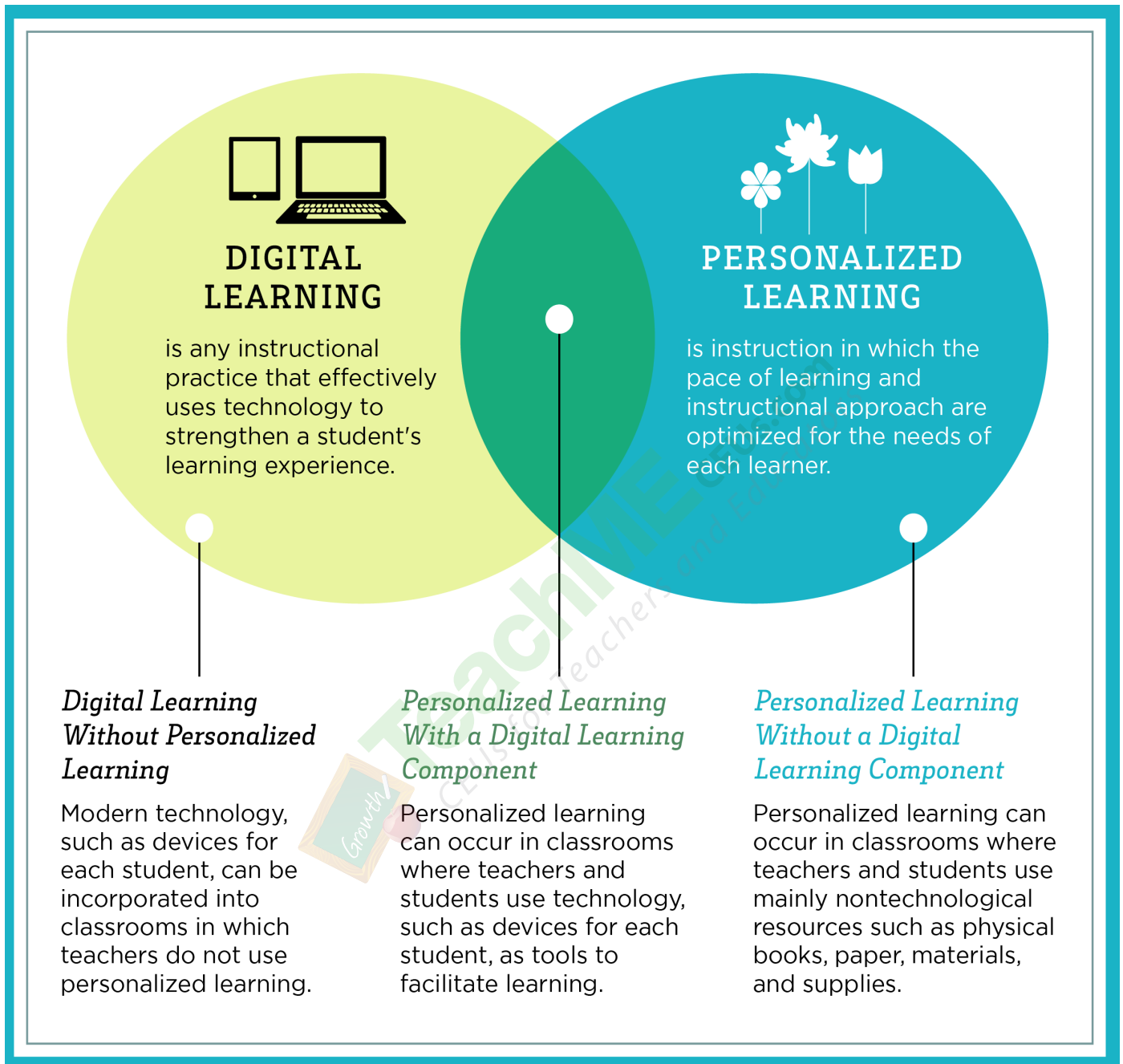
Figure 3. Digital versus personalized learning

OET also suggests that districts and states consider issues such as collaborating with others to leverage economies of scale (that is, get favorable prices from vendors by sourcing technology together); developing public/private partnerships; coordinating across agencies (such as K-12 working with higher education) to acquire technology; and refurbishing existing or donated devices. They note that because states and districts are at different points in their digital learning development, varying levels or combinations of these options may work best (Office of Educational Technology 2018).

Though grant funding is often part of a state's or district's initial personalized learning plans, this type of funding is usually for a specified period of time, and education agencies can experience financial difficulties if they do not plan how to sustain the initiative over time. The Matanuska-Susitna Borough School District in Alaska advises that leaders consider the following questions when strategically planning the use of grant funding (Flint 2017):

- What is our short-term implementation plan once we get the money?
- What is our long-term plan for sustaining grant objectives?
- How will we maintain materials and tools purchased with the funding?
- How will the grant impact our current staff (and will we need to hire someone new)?
- How will the education goals be sustained after the grant ends?

### Policy Considerations in Sustainability

Leaders at different levels—school, district, or state—should be aware of the relevant policies that may influence the sustainability of personalized learning in their location, and consider what is needed to work within these policy frameworks. At the school and district level, personalized learning may need to be integrated into existing policies or regulations for grading, scheduling, or learning environments. If there are potential conflicts (such as a mastery-based personalized learning plan not aligning with standard letter grades), educators and leaders need to investigate possibilities for mitigating these conflicts, and establish plans that will allow personalized learning to be successful. At the state level, key elements of personalized learning may conflict with policies related to grade-level progression or graduation, or state standards for content and assessment. Just as at the district level, leaders must consider and plan for these potential issues prior to transitioning to personalized learning.

## Ensure the Privacy of Personalized Learning Data

The privacy of student information is a key concern for education agencies, at both the local and state levels. The federal Family Educational Rights and Privacy Act (FERPA) requires the protection of the privacy of student education records, requiring specific processes be in place to ensure that parents (and students, after age 18) have certain fundamental controls over how and with whom education records are shared (U.S. Department of Education 2015). Additionally, many states have laws in place regarding privacy of student data. As data systems expand and data are used for more purposes, however, there is increasing concern about the potential vulnerability of student data, as well as issues related to cloud-hosted data, data destruction, and data ownership.

The U.S. Department of Education's Privacy Technical Assistance Center (PTAC) has developed numerous resources to help schools, districts, and states address concerns and ensure the privacy of student data. These include *Protecting Student Privacy While Using Online Educational Services: Requirements and Best Practices* (https://studentprivacy.ed.gov/resources/protecting-student-privacy-while-using-online-educational-services-requirements-and-best), which addresses privacy and security considerations relating to student use of computer software, mobile applications (apps), and web-based tools in the classroom; *Integrated Data Systems and Student Privacy* (https://studentprivacy.ed.gov/resources/integrated-data-systems-and-student-privacy), which covers a broad range of student privacy issues that education agencies must consider when using information from integrated data systems to guide decisions about programs and policies; *Cloud Computing FAQ* (https://studentprivacy.ed.gov/resources/cloud-computing-faq); and *Best Practices for Data Destruction* (https://studentprivacy.ed.gov/resources/best-practices-data-destruction). Additional PTAC resources are available at https://nces.ed.gov/programs/ptac/.

Further information about student data privacy and FERPA can also be found in the *Forum Guide to Education Data Privacy* (https://nces.ed.gov/forum/pub_2016096.asp).

## Develop and Maintain Support Structures

In addition to creating a strategic plan for the design and implementation of personalized learning, education agencies should also plan for how the transition will be supported. Support for teachers at the school level, as well as broader support from the district and state levels, is key to sustaining and expanding personalized learning.

### Support for Teachers to Effectively Use Data

Data collection and use help to ensure the success of personalized learning efforts. Data help teachers make decisions about students, resources, and available technology based on what they know about their students' status and progress. Understanding the strengths, needs, preferences, and mastery of individual learners can help teachers engage, motivate, and inspire their students, as well as provide them with the right resources at the right time (Digital Promise 2016). Administrators can support teachers by recognizing that teachers need ample training and support when learning to make data-informed decisions about students (Johns and Wolking n.d.), and by valuing and modeling good data use practices. In addition, teachers should be provided time for thoughtful reflection about data and their potential use for students or at the aggregate level. Finally, school and district leaders should ensure that teachers receive training about data privacy and security, as well as how to communicate about data to students and parents.

> **Supporting Teachers Using Data**
>
> In Ohio's Forest Hills School District, teachers work in collaborative teams to understand and utilize student personalized learning data. Collaboration time is carved out at each educational level.
>
> In Connecticut's Meriden School District, teachers are provided time for multiple conferences during which they discuss student data and project plans.

### School and District Support for Personalized Learning

Advances in personalized learning options—particularly in the technologies and tools to support personalized learning—are rapidly moving forward as support for personalized learning similarly increases. Teachers can now use many targeted technology tools and data collection options that are specific to various aspects of learning for different students across subjects and developmental levels (Digital Promise 2016). To do this successfully, they need support from school and district leaders.

School and district leaders can support data-informed personalized learning by

- restructuring learning environments to provide teachers with access to data;
- arranging schedules to allow teachers time in the day to reflect upon data and plan for their use;
- investing in training, coaching, and continuing professional development for teachers;
- providing opportunities for informal collaboration to share best practices across teachers and buildings;
- designing staffing models that support a flexible learning environment;
- creating an environment where teachers are supported as they create and tailor instruction to individual learners;
- providing and maintaining the technology needed for personalized learning;
- investing in infrastructure, such as updated data systems and high-quality tools; and
- engaging teachers, parents, and the community in discussions of the value of data-informed instruction.

School and district leaders should ensure that appropriate technology tools, technical infrastructure, and schoolwide and classroom routines are in place to minimize the burden that personalized learning may place on teachers. This includes researching and choosing curricula, learning materials, devices, and other technology (Rhode Island Office of Innovation 2017), and supporting teachers as they provide substantive feedback and formative assessment.

### State Support for Personalized Learning

Beyond the support needed from school and district leaders, state leaders can also provide critical support for personalized learning. Data systems, though necessary, are not enough (Data Quality Campaign 2016): effective personalized learning plans move beyond using systems to merely collect and manage data to a deliberate focus on using data to engage students and facilitate their progress toward goals.

CCSSO's Innovation Lab Network (https://www.ccsso.org/resource-library/innovation-lab-network-iln) supports a network of states that are working on various student-centered approaches, including personalized learning.

States can also offer more direct support of schools and teachers as they move into and maintain personalized learning efforts. The Rhode Island Office of Innovation (2017) offers several suggestions for state leaders, including these:

- Clarify and provide guidance regarding state regulations that may affect personalized learning plans.
- Develop funding streams to support the technology needed for personalized learning.
- Consider how (and whether) teacher preparation institutions are addressing personalized learning.
- Make relevant and useful resources about personalized learning available to districts, schools, and teachers.
- Dedicate the human capital resources needed to ensure that state leaders are knowledgeable about and can support personalized learning efforts.
- Track statewide personalized learning outcomes.

## Develop and Sustain Key Relationships

The development of effective and supportive relationships among stakeholders is also critical to the success of personalized learning. Clear communication among teachers, administrators, students, parents, and the community allows all parties to understand the goals of the plan, as well as the expected roles of different individuals. Teachers

need to know that they will have the resources and training to effectively engage students and provide them with meaningful learning opportunities. Students need to understand the philosophies behind personalized learning and know that their personal investment is distinctly tied to the usefulness of the endeavor for their learning. Parents need to understand the ways in which their children will be engaging academically, and how and why the practices and activities their children may experience will be different from what they themselves may have experienced as students. Members of the community who may be involved with various school activities—particularly those who are specifically supporting personalized learning tasks either inside or outside of the classroom—should know about the plans and activities related to personalized learning and how they can best provide assistance to students and academic staff.

Technology and data systems facilitate many of the functions of personalized learning, but they are not the only components of successful personalized learning implementation. Similarly, support is needed from the different educational and administrative levels involved in meeting student needs and overall learning initiatives. However, this support from each independent level is not sufficient on its own; also critical to successful implementation is the establishment of effective *relationships* among stakeholders.

The knowledge and understanding that teachers have of their students' learning goals and progress, as well as the supportive relationships they create with students, form the foundation of effective personalized learning. Teachers should create a classroom environment that is flexible and responsive, select high-quality content, work closely with students as they progress through the material, and adapt content when needed (Rhode Island Office of Innovation 2017). Students need to be able to trust in their teachers' abilities to meet these demands.

Beyond this foundation of student-teacher relationships, it is important to facilitate communication and trust among school leaders, district administrators, and state legislators in the pursuit of personalized learning goals. Personalized learning data should be viewed as a means to empower students and teachers by fostering improvement and helping teachers meet student needs. Across different groups of stakeholders, there can be varied coordinated efforts, such as these:

- Teachers collaborate with other teachers in personalized learning efforts and engage with school leaders about successes and challenges (Bill & Melinda Gates Foundation 2015).
- Data teams meet regularly to analyze student data and ensure that the tools and technology provided for personalized learning are meeting individual needs (Johns and Wolking n.d.).
- District and school leaders work with parents and the community to explain the value of data-informed instruction and how student information is protected (Bill & Melinda Gates Foundation 2015).
- State leaders develop the necessary funding streams to fulfill the personalized learning needs of districts and schools, and help schools understand how they can deliver personalized models within existing state regulations (Rhode Island Office of Innovation 2017).

## Communicate With Stakeholders

Personalized learning data are often reported not just to the teacher and student, but also to others such as parents, administrators, or district staff. In all cases, data need to be tailored to users and their purposes (Data Quality Campaign 2016). Parents need to understand their children's progress toward content understanding and learning goals, and may also use data to gain a better understanding of the nature of their children's personalized learning. (This is especially true if the parents are only familiar with more traditional educational experiences, such as A-F based grading systems.) School administrators need data to assess the success of different educational efforts, to make decisions regarding allocation of resources, and to determine staffing levels. For example, data that lead a teacher to utilize small instructional groupings may influence the way a principal assigns teachers' aides to classrooms. At the district level, data drawn from personalized learning assessments may indicate progress toward badging systems or content certifications. Across all of these individuals and levels, personalized learning data allow communication and decisionmaking about learning goals and educational progress.

> **Maximizing Existing Communication**
>
> Vermont will be including information about flexible pathways and personalized learning as components of the state's Education Quality Review snapshot and State Report Card, thus utilizing these existing mechanisms to share personalized learning data with parents and the public.

When communicating personalized learning data, school, district, and state leaders need to consider the particular stakeholder group and craft the message in a way that highlights the data most important to that group. Additionally, they should present the data in ways that will be comprehensible and accessible to particular stakeholders.

Personalized learning data shared with stakeholders might include

- expectations for personalized learning and how they will be met;
- progress toward established expectations;
- examples of formative data collected and how they influence classroom practice; and
- comparison data from before and after the transition to personalized learning.

**Checklist of Strategies to Support Personalized Learning**

- ✓ Create a strategic plan.
- ✓ Modify infrastructure and learning environments to support personalized learning.
- ✓ Plan for the sustainability of personalized learning.
- ✓ Ensure the privacy of personalized learning data.
- ✓ Develop and maintain support structures.
- ✓ Develop and sustain key relationships.
- ✓ Communicate with stakeholders.

**Issue in Focus: Moving Beyond Individual Classrooms to Systemwide Personalized Learning**

A report from Rhode Island's Office of Innovation (2017) suggests that personalized learning is a shift in the way we educate students, and that moving from individual teachers' efforts to systemwide personalized learning is new to all involved in education. The authors suggest that to be successful, schools and districts moving to a more comprehensive model of personalized learning should foster a culture that supports these practices, including allowing for discussion and adjustment of ideas, teacher development, and leadership capacity. In addition, the shift to personalized learning should be well considered and deliberate, with a solid and clear change management process in place. Ultimately, transforming a school or overall district to this type of student focus requires a culture change (Data Quality Campaign 2016). Vermont, for example, has incorporated personalized learning into its overall efforts to grow a culture of data quality and use; it is seen as a key part of the state's efforts to provide equal access to high-quality educational opportunities for students across the state. Similarly, leaders in Ohio's Mason City School District have described a goal of creating and sustaining a culture of learning for their students, staff, and administrators, focusing on individual student development and partnerships with families and the larger community. In many districts and states across the country, education leaders are considering shifts in focus and activities that allow a more innovative, student-centered perspective and culture.

# Chapter 5: Case Studies From States and Districts

The case studies in this chapter are intended to highlight various experiences of states, districts, and schools that have implemented or are transitioning to personalized learning, with a particular focus on how they are managing and using personalized learning data to support, monitor, or evaluate the process.

Just as definitions of personalized learning vary, the methods and priorities of the education agencies featured in this chapter differ in multiple ways and are based on each location's needs and goals. Additionally, it should be noted that all of the examples provided here are still developing.[2]

> In addition to the case studies described in this chapter, several districts and schools are highlighted throughout the document. Meriden Public Schools, in Connecticut, is featured in several chapters. Of the 12 schools in the district, the two high schools in Meriden use personalized learning. These two schools have an approximate enrollment of 2160 students, with 75.9% receiving free or reduced-price lunch. Grades 9-12 use personalized learning. Team Yellowstone, a school within a school at Sacajawea Middle School in Bozeman Public Schools (MT) is also featured throughout the document. Sacajawea serves approximately 800 students, with 60 students attending the school within a school.

## Westminster Public Schools (Colorado)

Westminster Public Schools (WPS) is the largest school district in the country to be entirely competency based from preschool through high school. WPS officially began its current competency-based personalized learning initiative in the 2009-10 school year, but this effort followed multiple earlier steps toward competency-based learning. Colorado first adopted standards in 1993, which gave students a common set of goals for each subject area and initiated district plans toward

> **Demographic Information**
>
> Approximate enrollment: 10,000
> Number of schools: 20
> Free and reduced-price lunch: 79.0%
> Grades using personalized learning: PreK-12
> https://www.westminsterpublicschools.org/

competency-based assessment. However, at that time, the available technology systems were not advanced enough to support the data load necessary for competency-based education. In 2007, a board member's visit to a state school board association meeting, which featured discussions on the implementation of standards-based education, led to new consideration of personalized learning at the district level. The district[3] began with a one-year pilot at a single elementary school while developing a communication and implementation plan for all stakeholders. After this one-year pilot, the

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[2] Also note that the demographic information provided in each example is for the overall district or state. Not all students in each location are necessarily involved in personalized learning plans.

[3] The district was at that time named Adams County School District 50.

district began the overall effort with the elementary and middle schools, and then moved up a year at a time, in specific subjects, through the high school level.

WPS's competency-based personalized learning efforts cross all subjects and grade levels, and are demonstrated in classroom instruction and activities, such as real-time regrouping of students based on student data and students progressing to the next performance level at any point during the school year. Students are aware of and engaged in the data process through goal setting and recording progress through either hardcopy data notebooks or online versions that are ultimately aligned to career aspirations and goals. Students move through different subjects at the level necessary for them to master the material. The schools have "leveling-up" assemblies as students achieve mastery in given performance levels for any subject. District leaders note that one of the key elements for successful competency-based personalized learning is actively developing student agency, such that students own their learning and are invested in the process. District leaders have concluded that it is essential that teachers have high-quality and effective ongoing professional development that teaches them to empower students.

As the district transitioned to competency-based personalized learning, they found that students at the high school level needed foundations and concepts courses in order to shore up their learning and move successfully into new ways of learning and assessment. Now that the initiative has matured, the foundation courses are no longer necessary, and the number of concept courses are greatly reduced.

Because personalized learning is a districtwide effort in WPS for all school levels, funding for the initiative is not seen as a separate entity, but instead the basis of the overall budget. Funding is directed where it is needed in the system (based on the outcomes of the continuous improvement processes), whether for technology and data systems, classroom support, or professional development. The district looks at funding for competency-based personalized learning not as one large amount to be spent at a single time, but as having funds available to allocate when and where they are needed. As they look to the future, their goal is to avoid overburdening the system by making too many adjustments and recognizing that schools will go at different paces and that the capacity to implement change needs to be effectively managed.

In retrospect, district leaders acknowledge that their incremental path to competency-based personalized learning led to various challenges. As the initiative expanded, high school students in particular moved between one system and the other, which caused confusion for students, parents, and teachers. Within the high school level, the district began by introducing competency-based personalized learning in math, literacy, science, and social studies courses, but the different means of assessing students (based on whether the teachers did or did not incorporate these methods) meant that two types of student report cards were needed—one for core subjects and another for electives. Additionally, families faced different assessment and grading systems for children at different grade levels: one sibling might be doing personalized learning while another was still under a traditional model. These variations made it hard for parents to understand and commit to the new way of doing things during the initial implementation stages.

Because of these challenges, leaders from WPS advise other educational agencies to plan for a full-system model from PreK-12 and get commitment across all stakeholder groups before moving forward. The full shared vision is needed prior to implementation, with communication and understanding of overall goals from teachers, parents, and students. All parties should be involved, with significant emphasis placed on ongoing professional development and well-structured and supported professional learning communities. If an incremental implementation is needed, they

recommend introducing different elements of personalized learning in layers, rather than moving by grade level. They suggest, for example, that a district could move to competency-based standards in year one, establish proficiency scales in year two, and introduce the recording and reporting system in year three. To help other schools and districts transition to a personalized, competency-based system, WPS hosts site visits and an annual summit.

### Working With Personalized Learning Data

WPS describes its competency-based personalized learning data process as active, as opposed to the passive "rear mirror" view of data usage in traditional educational models. Data are collected and used in real time, allowing students to know where they stand in relation to different learning targets for each subject area, as well as allowing teachers to regularly group and regroup students based on their mastery. This creates a process that is akin to response to intervention (RTI) or multi-tiered systems of support (MTSS) models, wherein schools can have regular assessment of students potentially falling through the cracks, and teachers can determine what interventions or extensions may be needed. District leaders state that this type of data use requires a heavier data burden for teachers, especially when dynamic recording and reporting systems are used. Leaders stress that strong ongoing professional development is needed to make sure teachers are well prepared for both the academic as well as noncognitive skill development.

Student progress is recorded on a four-point scale, where a 3 is considered competency (this means that a 3 is also akin to an A; a 4 in WPS is seen as a much higher level of rigor than it would be in a more traditional 4-point system). This system does not translate equivalently with all systems across the state, which can lead to issues with student transfers and scholarship programs that are based on traditional grades. This is becoming less of a challenge as more schools and districts begin to utilize competency-based approaches.

District schools use two data systems: a student information system (SIS) that collects overall demographic and attendance data and allows state reporting, and a competency-based learning management system (LMS) that provides student data directly aligned to competencies while allowing assessment and the reporting of student progress. The LMS allows student data to exist across all the years a student is enrolled in the district and for all content areas, rather than only a single school year, so that the data evaluation can be student centric rather than course centric.

At the school level, classroom data are reported in three-week cycles and reviewed by principals. Principals meet regularly with the superintendent, discussing school-level summative data to determine how the data align with the goals and action steps of the school improvement plans. Administrators also engage in monthly "learning walks" at the district level and discuss factors that are either impeding or accelerating the progress of the system. Annually, principals directly and publicly report their schools' data journey to the Board of Education, which is fully invested in Westminster's Learning Model (see https://www.westminsterpublicschools.org/Page/10746).

District leaders note that they have had challenges aligning the competency-based system with state reporting requirements because establishing typical teacher-student data links is more difficult under personalized learning systems. State reporting requires student scores to be attached to particular teachers for the duration of a school year, which is not how assessment works within their competency-based systems. When students "level up" in the competency system, they may stay with the same teacher or move to a different teacher. Additionally, multiple teachers may work with students to address learning gaps or areas of promise identified by student data. Ultimately, it is difficult for the district to fit its data into the current traditional data "buckets" prescribed by the state.

# Forest Hills School District (Ohio)

Forest Hills School District (FHSD) began its transition to personalized learning during the design of its 5-year strategic plan. Upon the arrival of a new superintendent in 2014, the district began a process of surveying stakeholders and examining potential ways to better prepare their students for post-graduation success. With a focus on empowering each student to achieve personal academic success, FHSD began a shift to personalized learning as a core element of the strategic plan.

> **Demographic Information**
>
> Approximate enrollment: 7,450
> Number of schools: 9
> Free and reduced-price lunch: 10.4%
> Grades using personalized learning: K-12

The district first focused on transforming the learning experiences of teachers, focusing their professional development on various aspects of personalized learning and giving them opportunities to develop plans to align learning experiences with student needs. Gathering knowledge and support from a varied group of personalized learning experts, district leaders developed a districtwide shared curriculum with new standards incorporating what they call the "6 Cs": collaboration, creativity, critical thinking, communication, citizenship, and character. Teachers have been encouraged to explore ways in which students meet those standards to provide a more personalized learning experience for each student. As district leaders have studied innovative teaching and learning practices, they have simultaneously tried to model effective practices, offer unique pathways, and support collaboration opportunities for educators. These have included "anytime/anywhere" learning opportunities, job-embedded professional learning, and conference style/project-based professional learning.

The district has placed great importance on collaboration among instructional staff. Weekly collaborative time has been established for all teachers in the district to work together to develop creative and effective ways to move from a teacher-centered to a student-centered classroom. Instructional coaches work with teachers to implement strategies such as blended learning, problem-based learning, flipped classrooms, and balanced assessments for mastery.

In their collaborative teams, teachers work to consistently return to four key questions:

- What do we want students to know and be able to do?
- What is the evidence/how will we know when they have learned it?
- How do we respond when students don't learn?
- How do we extend and enrich learning for students?

## Working With Personalized Learning Data

FHSD has been transitioning to personalized learning while concurrently developing common assessments. District leaders built a framework for a balanced assessment system with both internal and external assessments, and the assessment system is still a work in progress. After exploring item banks, assessment tools, and products, they have found value in creating their own assessment items.

District leaders note that they have not yet built mastery levels, but they will move to "a more mastery-based conversation" over time. At this point, they maintain a greater focus on helping teachers identify what students need to

know and be able to do in a personalized learning program, and establishing success criteria to show clear evidence of learning.

The district uses a data warehouse and multiple spreadsheets to monitor and track student learning. District leaders acknowledge that this system is not as flexible and dynamic as it should be, and expect that it will need to improve in order to allow teachers to be efficient and effective when dealing with personalized learning data. When asked about data flows between districts and the state agency in Ohio, they noted that to be effective, their statewide data management system would need to be designed to meet the real-time data needs of teachers, as well as to handle both big-picture data of a grade level or district and standardized data for the state. They asserted that many districts are challenged by the issues with the current system, which require additional staff efforts.

## Mason City School District (Ohio)

Mason City School District (MCSD) is working with several options for students and teachers as they develop strategies for personalized learning and continue transitioning from more traditional educational models toward a broad personalized learning approach. District leaders emphasize the importance of growing "the next generation of engaged citizens, problem-solvers and leaders" and feel a responsibility to encourage

> **Demographic Information**
>
> Approximate enrollment: 10,600
> Number of schools: 5
> Free and reduced-price lunch: 8.3%
> Grades using personalized learning: PreK-12

students to embrace a culture of healthy risk taking as they assume a bigger role in driving their own learning. One of the first changes was to add Personal Learning Days to the school calendar. On these days, students have the opportunity to create and embark upon personalized interest projects outside of school. These may include service learning, global awareness projects, online collaboration, and many other diverse opportunities that are often difficult to fit into the district's current curriculum. In their first year of Personal Learning Days, students designed activities such as field trips to specialized science labs, job shadowing days with doctors and business leaders, environmental sustainability projects, and specialized volunteer opportunities.

Leaders have also been working to engage teachers in personalizing their own learning and to expand their creative possibilities. Designating Personal Learning Days for students created additional time for teacher collaboration and professional development. District leaders have worked with teaching staff to establish and discuss why personalized learning is important, to help them understand that they should view it as a continuum, and to consider creative ways to allow students to customize their education. Building on conversations with multiple experts in personalized learning, the district is continuing to expand teachers' understanding of and comfort with the concept, with a plan to move toward a more expansive personalized learning perspective that includes five key elements.

The first key element is a learner profile that is created by learners, to support the learning process, development of student voice, and self-discovery. The student is the steward of the learning profile. Serving as a collection of information used to personalize learning, the profile includes the learning drivers, strengths, and challenges, as well as evidence of learning and growth inside and outside of the classroom. The second key element is the learning environment, which includes the space-time continuum for learning. It aligns virtual and physical spaces, time for learning, and groupings of learners to maximize progress toward learner outcomes. The third element is learner relationships, which provide the foundation for a positive, inclusive, and engaged learning culture. In personalized learning, the goal is to develop

expert learners who are empowered to know themselves well, advocate for their needs, and drive their own learning throughout life. These relationships reflect trust and respect for who students are as learners and as people. The fourth element is learning paths, which are an opportunity for all students to collaborate with teachers and other key members of their network to co-design meaningful, authentic, rigorous, and relevant learning experiences. Finally, the fifth key element is learner outcomes, which are the clear, compelling goals for learning that include the following:

- **Skills:** Cross-disciplinary outcomes for critical thinking, collaboration, communication, and creativity
- **Mindsets:** Attitudes or beliefs that impact learning, including optimism, flexibility, resilience, persistence, and empathy
- **Content Standards:** Subject-area goals

### Working With Personalized Learning Data

Because MCSD is in the beginning stages of its personalized learning efforts, its educators are still considering how data will most effectively be collected and used by teachers, schools, and district leaders. They are working on determining a measurement that shows not only academic progress but also elements such as engagement and behavior growth. The district currently uses standards-based grading, building on a mastery framework in grades K-5. At this time, district leaders are researching options and working with teachers to transition mindsets, gain insights, and co-create MCSD's progress-monitoring system, as they transition into broader personalized learning activities. The district has yet to define its metrics for measuring personalized learning.

Information from the students' Personal Learning Days is not logged into the district's SIS in any formal way (though teachers may document some data related to student reflections). The district's learning management system (LMS) is currently used to inform parents of their children's progress, which is currently based on more traditional academic measures. District leaders state that they would ultimately like to measure data on the "entire student" and his or her experiences, which would include mental wellness, engagement, "difference maker" attributes, academics, projects, and service transcripts.

MCSD currently provides an intranet portal, called MasonConnects, to staff and students that pulls relevant information from the existing SIS. Starting in January 2019, through a development partnership, MCSD will co-develop a system for students to create a robust and fluid learner profile allowing teachers and support staff to better understand the students they serve. Most importantly, the learner profile provides an opportunity for students to reflect upon themselves as learners, one of the five elements of personalized learning. Lastly, MasonConnects aggregates assessment data and offers personalized professional learning, another key factor involved in moving toward personalized learning in the classroom.

## Westside School District (Nebraska)

Westside Community School District's (WCSD) transition to personalized learning began as part of its larger strategic plan. In the spring of 2014, the district's strategic planning included a vision statement that called for concepts such as innovative educational ideals, personalized learning, and ensuring a broader, richer definition of success. These concepts were drawn, in part,

> **Demographic Information**
>
> Approximate enrollment: 6,000
> Number of schools: 13
> Free and reduced-price lunch: 31.3%
> Grades using personalized learning: K-12

by focus groups conducted during the strategic planning process, who asked that the district work to customize learning for each student. The district teams involved in the planning of the effort were committed to putting the learner at the center of the learning experiences.

Like many education agencies, WCSD faced the challenge of defining personalized learning and what it should mean in the context of the district. Planning teams researched the topic and ultimately tried to synthesize the information gathered from different sources to develop a plan that worked best for the district's students. The district began the implementation using what they called a "slow roll." They began by identifying a group of "Personalized Learning Early Adopters," who would learn about personalized learning, try new strategies in the classroom, and then share their experiences with other teachers in their professional learning communities. Teacher representatives from each of the districts' ten elementary schools, one middle school, one high school, and one alternative school sent multiple representatives to various trainings that were spread out over the course of the school year. Professional learning for these teachers included developing lessons and curricular units, meeting to discuss and share how these lessons and units worked in the classroom, and then returning to the classroom to implement modified plans based on the discussions with their peers. The district has focused the development of and transition to personalized learning on a philosophy of "student-centered learning by doing." District leaders plan to continue to move new groups through the professional learning and implementation process each year, allowing an organic change movement to occur across the district.

WCSD has also received guidance in its process from consultants from personalized learning organizations and a popular personalized learning textbook. This guidance, as well as the strong leadership from district- and school-level leaders, has allowed the district to work through initial teacher confusion about personalized learning and how it fits into existing teaching and assessment models.

## Working With Personalized Learning Data

Because WCSD is still developing and expanding its personalized learning efforts, it is not collecting specific personalized learning data at the district level; the main collection that relates to these efforts is the annual strategic plan survey. In classrooms, teachers collect data and conduct observations related to the five key elements of personalized learning defined by the district and its leaders: knowing your learners; flexible groups, space, and mindsets; voice and choice; data-informed; and technology support. Within the data-informed element, teachers use student learning information to make specific decisions about student growth related to instructional standards. Beyond this, student progress is assessed as it was prior to the transition to personalized learning. In future school years, various teacher and administrator leaders in the personalized learning movement have partnered with educators from partner districts around the country to begin action research that is classroom focused.

Data related to the five key elements that are collected are not entered into the district's SIS. The district is currently experimenting with creating a personalized learning plan through its digital learning platform, and has considered the possibility of having data prepopulate the desired fields once this is established.

# Vermont Public Schools

In Vermont, state law and state board of education rules require that, in grade 7 and beyond, students have personalized learning plans (PLPs) and access to flexible pathways for learning. PreK-6 schools are not required to offer personalized learning, but it is encouraged. State statutes include requirements for access to specific pathways, including Dual Enrollment, Career and Technical Education, and Early College.

State leaders describe a long history of educational innovation in Vermont, which has culminated in recent years in the Flexible Pathways Initiative (http://education.vermont.gov/ student-learning/flexible-pathways) and the Education Quality Standards. These initiatives have three overall goals:

- All Vermont children are afforded educational opportunities that are substantially equal in quality.
- All Vermont students graduate from secondary school.
- All Vermont graduates are career and college ready.

Vermont is a local control state (wherein most decisionmaking power is at the district level), but the state education authority is also highly supportive of districts' personalized learning efforts and is working to provide guidance and resources to help them meet instructional and data requirements. In particular, state leaders are trying to ensure a coherent and equitable approach to education and personalized learning through alignment among state legislation (e.g., Act 77), the new Education Quality Standards, and the state's Every Student Succeeds Act (ESSA) plan. The state convened a PLP working group to develop a series of resources and guidelines to assist districts in the implementation of the personalized learning planning process (https://education.vermont.gov/ student-learning/personalized-learning/personalized-learning-planning-process) and the state's Proficiency-Based Graduation Requirements (https://education.vermont.gov/student-learning/proficiency-based-learning/ proficiency-based-graduation-requirements). This group was comprised of many stakeholders, including students, teachers, school counselors, principals, superintendents, and representatives from higher education.

### Working With Personalized Learning Data

State leaders are in the process of establishing Vermont's approach to the collection and use of personalized learning data. In collaboration with stakeholders, they are developing criteria for measuring the degree of personalized learning implemented, as well as the type and quality of personalized learning. The state's ESSA plan includes criteria for the implementation of personalized learning.

In regard to measurement of student progress, the state has provided guidance to districts that they must provide evidence that they are meeting performance-based graduation requirements (defined at the district level), that student progress is being monitored through PLP reviews, and that schools are identifying the learning targets that students must meet as they progress toward proficiency. It also provides guidance surrounding data collection. Though the state does not dictate the means by which personalized learning data are housed and used at the school level, it provides collection

### Demographic Information

Approximate enrollment: 88,428
Number of schools: 313
Free and reduced-price lunch: 41.02%
Grades using personalized learning: 7-12

Number of schools: https://education.vermont.gov/ data-finance-budget-book-2019
Enrollment/FRL: Vermont Agency of Education. (2018). *Child Nutrition Programs: Annual Statistical Report.*
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mechanisms and guidance for reporting the data required by the Vermont Education Quality Standards and the ESSA state plan.

Additionally, the state provides technical guidance to assist districts, which can include things such as sample templates and activities to assist educators in their daily practice. It also provides training around both personalized and proficiency-based learning through its professional learning network.

Vermont is in transition in regard to which data are incorporated into its SLDS. As part of the state's ESSA plan and its school climate measures, it will be including measures of students' engagement and role in the development of their PLPs. As part of the College and Career Readiness elements of students' PLPs, the state is collecting Dual Enrollment data as well as Early College participation. In addition, students' participation in Career Technical Education and the High School Completion Program will eventually be included in the ESSA State Report Card and statewide longitudinal data system (SLDS).

At present, the state collects student transcript data via the Student Educator Course Transcript (SECT) collection, which will soon be incorporated into the automated reporting system via the SLDS. These data make the linkage between students, the courses they take, the educators who teach them, and the grades those students earn. State leaders explain that like the current SECT collection, these data will have to conform to specifications that their school/district SIS systems will have to meet in order to be automatically reported in the SLDS environment. Specifications are due for release in 2018.

## Utah Public Schools

In 2012, the Utah legislature passed a law called the Student Achievement Backpack, which allows data exchanges between districts. This went hand in hand with a move to competency-based education (Utah generally uses the term "competency-based" rather than "personalized learning"). Competency-based education in the state is best reflected in its Competency-Based Learning Exploratory Pilot, which includes 13 charter school

> ### Demographic Information
>
> Approximate enrollment: 647,870
> Number of schools: 1,050
> Free and reduced-price lunch: 29.0%
> Grades using personalized learning: K-12

and district grantees. Utah's state definition for "competency education" (articulated in the Utah Code) is the iNACOL definition (https://www.inacol.org/news/what-is-competency-education/). The Competency-Based Education Grants Program consists of grants to improve educational outcomes in public schools by advancing student mastery of concepts and skills through five core principles: (1) student advancement upon mastery of a concept or skill; (2) competencies that include explicit, measurable, and transferable learning objectives that empower a student; (3) assessment that is meaningful and provides a positive learning experience for a student; (4) timely, differentiated support based on a student's individual learning needs; and (5) learning outcomes that emphasize competencies that include application and creation of knowledge along with the development of important skills and dispositions. Early implementers have taken various approaches in instructional practices as well as data collection and use.

Notably, Utah differs in its approach, as compared to many other states, in that personalized learning is the way in which districts are implementing digital teaching and learning: that is, the data and technology initiatives are driving the educational approaches, rather than the other way around. Whereas many states or districts decide to implement

personalized learning and then figure out data processes and regulations, Utah is allowing districts in the qualified grant program to determine how their instruction can be structured to meet the data requirements of their technological approaches.

At the junior high level, the state has relaxed rules on course requirements: rather than requiring students to take specific courses, students can take types of courses (e.g., a set number of math credits). This allows districts more flexibility in what to offer and returns a level of local control. Some districts see this flexibility as opening up opportunities for student choice, but others have maintained their traditional course requirements.

### Working With Personalized Learning Data

Districts participating in the Competency-Based Learning Exploratory Digital Teaching and Learning pilot vary in how they approach competency-based personalized learning data. Some have made changes to their assessment models and data systems in order to use standards- and domain-based competencies: for example, using a mastery scale of 1-4 to represent student progress. Other districts use a mastery system, but translate the 1-4 competency levels to letter grades for student transcripts. While this can make data more transferable or comprehensible to various stakeholders, it goes against effective implementation of the concepts of competency-based learning.

However, those districts working with the mastery levels have experienced challenges in transferring data to other districts. If a student transfers from a "mastery district" to one using traditional letter grades, it can be difficult to use transcripts to determine accurate placement into courses in the new district. Districts try to establish equivalency between courses, but these fundamentally different assessment approaches can cause difficulties. Districts may decide to assume, for example, that a mastery rating of 4 equals an A grade, but the differences in intent of these two types of assessment mean that this is not necessarily the case. To put it another way, a mastery rating of 1 would not mean a student is seen as an "F student" in a personalized learning system—it would simply mean that the student has not yet mastered the material, and that the learning plan should be adjusted such that the student has the time and necessary support to do so. At this time, state leaders are still working on how to aid districts in these types of communications, especially as more districts apply for Competency-Based Learning Exploratory Pilot grants.

## Idaho Public Schools

Personalized learning efforts in Idaho currently take place through varied programs, at several educational levels. These include the Idaho Digital Learning Academy (IDLA), a mastery badging system called SkillStack (https://skillstack.idaho.gov/), and the Idaho Mastery Education Network.

> **Demographic Information**
>
> Approximate enrollment: 647,870
> Number of schools: 1,050
> Free and reduced-price lunch: 29.0%
> Grades using personalized learning: K-12

The Idaho Digital Learning Academy (IDLA; https://www.idahodigitallearning.org/) was created 15 years ago when superintendents in the state supported the expansion of online learning, but feared the confusion that might be created if districts developed their own systems independently. Instead, IDLA is a state-level entity that brings digital learning to Idaho's students: a particularly important issue in a state where so many students live in rural areas. Its mission is to provide greater opportunities and educational equity to students across the state.

IDLA currently has three main areas focused on mastery-based and personalized learning:

1. Its core business is offering online courses with a certified online teacher: these courses have had 30,000 enrollments within the last year. IDLA officials state that one in four high school students in the state take a course with them each year, with more enrollment in rural areas.
2. It supports districts in their mastery-based instructional efforts. At this point, the team works with about half of the mastery schools in the state.
3. It partners with other states in infrastructure efforts, particularly those focused on establishing a framework for personalized learning that allows portability. Because personalized learning offerings tend to be very systems dependent at this time, it is difficult to transfer concepts and mastery evidence when a student transfers schools or locations.

SkillStack is a mastery-based badging system in which badges indicate levels of mastery of particular content or skills, and can be used to equal university credit or an indication of career and technical education competency levels. The badges are intended to easily communicate an individual's mastery of a particular content area, whether this was gained in an online course, certification program, or college class. The system aims to support students in their education as well as careers: postsecondary institutions and career and technical education entities have worked together to define the meaning of different badges, and they thus indicate the same mastery of content in either arena. Various industries are involved in the project, to ensure that the badges reflect the correct skills.

The Idaho Mastery Education Network (IMEN; https://www.sde.idaho.gov/mastery-ed/) is a consortium of districts focused on competency-based and blended learning. The state department of education selected 19 regionally diverse schools for the pilot program, each of which is developing unique approaches to mastery education. The IDLA currently works with 9 of the 19 IMEN districts.

### Working With Personalized Learning Data

The different personalized learning programs in Idaho use data in a variety of ways. For example, in online mathematics courses offered by IDLA, personalization is based on student mastery of content. Students use a tool called EdReady (https://idaho.edready.org/home), which helps them prepare for math aligned to a specific exam or state standard. Once they take a unit pretest, the system identifies the content they need to meet their goals. The system uses questions aligned to educational objectives to determine whether the student has mastered the content. It can then assign work based on missed objectives.

In the SkillStack system, data are used to determine whether a student has mastered the content needed to earn a particular badge. At this point, a teacher must manually provide the evidence that a student has reached a particular mastery level, which currently puts a substantial burden on teachers (particularly on top of their other tasks). However, system designers are working toward a configuration in which students could determine appropriate evidence and submit it, allowing the teacher to simply approve the submitted information. Designers are also working toward a universal record storing function that could offer a universal gradebook. In this arrangement, marking students as competent in one system would carry over to others, thus reducing the burden on individual instructors. Another potential vision is for internship programs or apprenticeship supervisors to have the capacity to certify students for mastery, thus increasing the crossover of the system between secondary/higher education and industry.

## Lessons Learned

Though there is great variation in the design, implementation, and maturity of the personalized learning programs summarized in this chapter, the experiences of the stakeholders in the different locations echo many similar challenges and solutions. The list below is a summary of lessons learned by the leaders in these and other education systems:

- Encourage communication among stakeholders and develop specific, intentional means for collaboration.
- Co-create the vision for the personalized learning program.
- Start with a guiding coalition of committed individuals.
- Determine reasonable timelines for change, and leave room for unexpected challenges.
- Consider the types and specific uses of data involved with personalized learning.
- Know that the core elements of personalized learning take time to build. Allow time for ideas to incubate.
- Foster a culture of innovation and encourage creative approaches.
- Consider the goals of and vision for the personalized learning program when determining how to assess its success and impact.

# Chapter 6: Issues to Consider

Across the country, some states and districts working with personalized learning have well-established programs that have been in place for several years, while others are just beginning to assess what tools and resources would be needed to implement a plan appropriate to their needs. Some locations have focused their efforts on a particular educational level (e.g., middle school or high school), while some see personalized learning as a means for students to reach their college or career goals. The practicalities of these efforts range considerably as well: some education agencies may see personalized learning as a way for teachers to provide more meaningful classroom learning, while others have focused on digital learning or activities done independently by students outside the classroom. Educators using methods such as Montessori have long espoused the central tenets of recent personalized learning, such as child-directed activities (with teacher guidance), creative learning, and self-directed work. In short, though *personalized learning* is a term used by many educators, it can mean many different things in practice.

The states and districts whose personalized learning plans have been highlighted throughout this resource demonstrate these variations. These plans differ in the nature and scale of their efforts: for example, there are district-level programs, state-supported pilot programs for selected districts, state programs that support personalized postsecondary planning, district programs to support individual learning beyond the classroom, and statewide programs supporting varied endeavors. Across these divergent efforts, however, several key issues have emerged, the consideration of which can guide education leaders toward greater levels of success.

## The Challenges of Personalized Learning

The use of personalized learning has been steadily increasing in many areas of the country, but it does not come without challenges. As more states and districts move toward personalized learning, they may face varied challenges in preparation and execution. Some of these challenges are technical, such as inadequate or aging data systems, while others are practical, such as how to transition to new ways of evaluating student achievement.

### Data Systems and Staffing

In order to effectively use student data to support personalized learning, schools and districts need to consider as they plan their data systems that personalized learning data may be different and extensive. With the increase of data-informed instruction and expansion of data capacities such as statewide longitudinal data systems, many education agencies are better prepared than ever to handle these requirements. However, some are not yet able to meet the expanded data- and technology-related demands of personalized learning. Data systems may not be sophisticated enough to handle significant amounts of learning analytics data, for example, or systems may not be linked in such a way that data can effectively be shared across classrooms, schools, or districts. This limits the possibility of collaboration across data teams, and may

also be a problem in areas of significant student mobility (Baker 2016). Common data system challenges related to personalized learning that have been identified by states and districts include the following:

- Varied data systems used by different districts within a state can present a challenge for facilitating communication among districts.
- A lack of flexibility in data systems can prevent states and districts from effectively capturing, interpreting, and using personalized data.
- Districts still have reporting responsibilities for outcomes (e.g., grades, course completion, transcripts, teacher effectiveness metrics), and the way these data are reported upward may be affected by the introduction of personalized learning and mastery data.
- Mastery and competency systems designed to connect secondary, postsecondary, and industry entities raise questions about whose responsibility it is to assess mastery and record these data—high school teachers, higher education faculty, or industry representatives.

As education agencies make broad and far-reaching changes in how learning is organized and assessed, they continue to face many questions and challenges of a practical nature.

## Transitioning to a Mastery Perspective

In some cases, personalized learning's typical focus on mastery-based progression has been the source of challenges. In most personalized learning environments, students move to new concepts or objectives when they

> In Connecticut's Meriden School District, personalized learning coordinators work to align each student's personalized learning experience to state standards. Additionally, a review committee at each high school samples 5 percent of the projects to provide an independent review of their rigor.

can demonstrate mastery. This differs from traditional arrangements in which a given learning activity is allotted a certain amount of time (Rhode Island Office of Innovation 2017). Additionally, evaluation of achievement may be different: students are generally deemed as having reached mastery within a given domain, rather than receiving a numeric or letter grade. Because of these differences, schools or districts can have problems transferring meaning about a student's educational progress or achievement to other institutions, whether they are within K-12 or in higher education.

For example, Utah is still establishing how to transfer information about a student if he or she moves from a school using a mastery-based system to one still using traditional grades: the receiving school is not set up to interpret such a differing transcript. Leaders in Ohio's Forest Hills School District note the challenges of "dealing with the ambiguity" of personalized learning and transferring to a student-centered, mastery-based perspective. Additionally, many schools using mastery-based progression have struggled with alignment with state-mandated tests focused on grade-level content (Hyslop and Mead 2015), as well as comprehensible transcripts for college applications. Connecticut's Meriden School District has mediated questions about the academic rigor of personal learning projects and their alignment with traditional curriculum (see text box). At this time, there is minimal research focused on the implementation of competency- or mastery-based instruction (Ryan and Cox 2017), leaving education agencies without a wealth of models or best practices.

## Student Assessment and Grades

Many schools and districts find themselves struggling to align issues such as competencies and mastery-based assessment with more traditional educational structures and expectations, such as year-end summative assessments—many of which

focus on grade-level standards or content (Hyslop and Mead 2015). Education agencies that have moved to mastery demonstration, badging systems, or certifications of content knowledge can find it difficult to draw clear parallels to the grading systems and test scores that may be used by other districts or the state; students may also face challenges when applying for colleges or scholarships. In some cases, schools choose to provide a more limited version of mastery-based assessment, or they may try to translate mastery-level data to align with more standard grading systems when sharing data with other locations. A 2015 RAND study indicated that due to various impediments, many schools may implement only some elements of competency-based instruction, such as setting competency thresholds and providing students with appropriate content. Structural components like traditional grade levels and state reporting requirements may keep schools from more complicated elements of mastery-based systems (Pane, Steiner, Baird, and Hamilton 2015). In other cases, schools or districts may hesitate to introduce personalized learning at all.

## Continuing Questions

As the popularity of and expectations for personalized learning continue to expand, the transitions occurring in states and districts across the country are nonetheless still works in progress. States and districts have identified many necessary elements for success, but questions remain as personalized learning becomes part of the educational plan in more and more places. Education leaders are still grappling with issues such as these:

- How to meaningfully incorporate technology, rather than assuming that digital learning automatically equals "personalized" learning
- How to engage students who still need more guidance, even when working on individualized tasks
- How to ensure that personalized learning options are equitable across schools or districts with different funding levels
- How to ensure the privacy and security of student data
- How to work within existing laws or regulations to reach desired or mandated goals

As the number and size of personalized learning programs in states and districts continue to grow, education leaders must work with their varied stakeholders to determine the particular needs of their location and students, and think strategically to design and implement plans that will not only allow their students to reach their goals but also be sustainable over an extended period of time. Needs assessments should carefully consider the data elements, tools, and systems required to effectively evaluate information and reach intended goals, as well as what steps must be taken in resource building to ensure that these needs are met. Support systems should be developed such that teachers and students have the resources, training, and assistance to embark upon personalized learning effectively; in particular, teachers need specific training and guidance on collecting and utilizing personalized learning data. Opportunities for collaboration should be built into the design such that teachers and leaders can discuss and use data, as well as share ideas, innovations, and solutions to challenges.

Personalized learning allows new and innovative perspectives on learning, but also requires careful consideration of a myriad of variables. This resource was designed to provide education agencies at various stages of the development process specific practices and areas of consideration that may help them in their endeavors, and allow them to meet the educational needs of diverse students.

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# National Forum on Education Statistics Resources
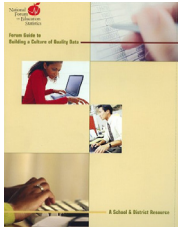
### Forum Guide to Building a Culture of Quality Data: A School and District Resource (2004)
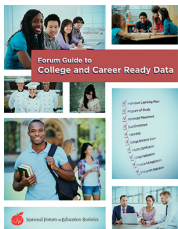https://nces.ed.gov/forum/pub_2005801.asp
This guide shows how quality data can be achieved in a school or district through the collaborative efforts of all staff and offers recommendations to staff in schools and school districts about best practices for improving data quality.
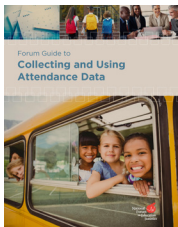
### Forum Guide to Collecting and Using Attendance Data (2008)
https://nces.ed.gov/forum/pub_2017007.asp
This guide provides best practice suggestions, real-life examples, a standard set of attendance codes, and role-specific tip sheets to help state and local education agency staff improve their attendance data practices.

### Forum Guide to College and Career Ready Data (2015)
https://nces.ed.gov/forum/pub_2015157.asp
This guide outlines the data needs and helpful analytics for five use cases (individual learning plans, educator support systems, postsecondary feedback loops, accountability systems, and career technical and education programs) that support SEA and LEA college and career ready initiatives.
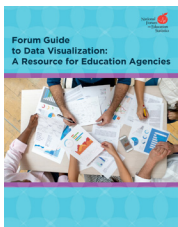
### Forum Guide to Data Visualization: A Resource for Education Agencies (2016)
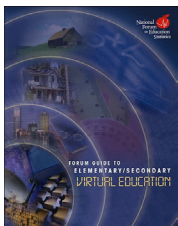https://nces.ed.gov/forum/pub_2017016.asp
This guide recommends data visualization practices that will help education agencies communicate data meaning in visual formats that are accessible, accurate, and actionable for a wide range of education stakeholders.
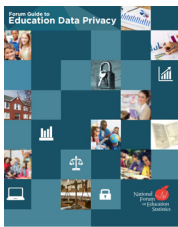
### Forum Guide to Education Data Privacy (2016)
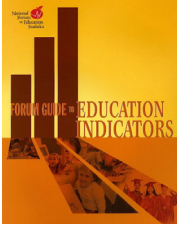https://nces.ed.gov/forum/pub_2016096.asp
This guide was developed as a resource for state and local education agencies (SEAs and LEAs) to use in assisting school staff in protecting the confidentiality of student data in instructional and administrative practices. SEAs and LEAs may also find the guide useful in developing privacy programs and related professional development programs.

### Forum Guide to Elementary/Secondary Virtual Education Data (2016)
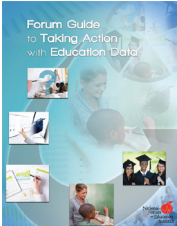https://nces.ed.gov/forum/pub_2016095.asp
This publication provides information on the impact of virtual education on established data elements and methods of data collection and addresses the scope of changes, the rapid pace of new technology development, and the proliferation of resources in virtual education.

## Forum Guide to Education Indicators (2005)
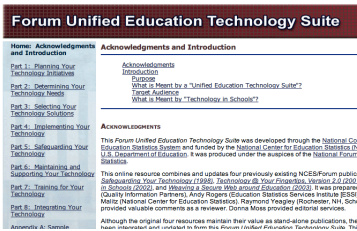https://nces.ed.gov/forum/pub_2005802.asp
This guide provides encyclopedia-type entries for 44 commonly used education indicators. Each indicator entry contains a definition, recommended uses, usage caveats and cautions, related policy questions, data element components, a formula, commonly reported subgroups, and display suggestions.



## Forum Guide to Taking Action with Education Data (2012)
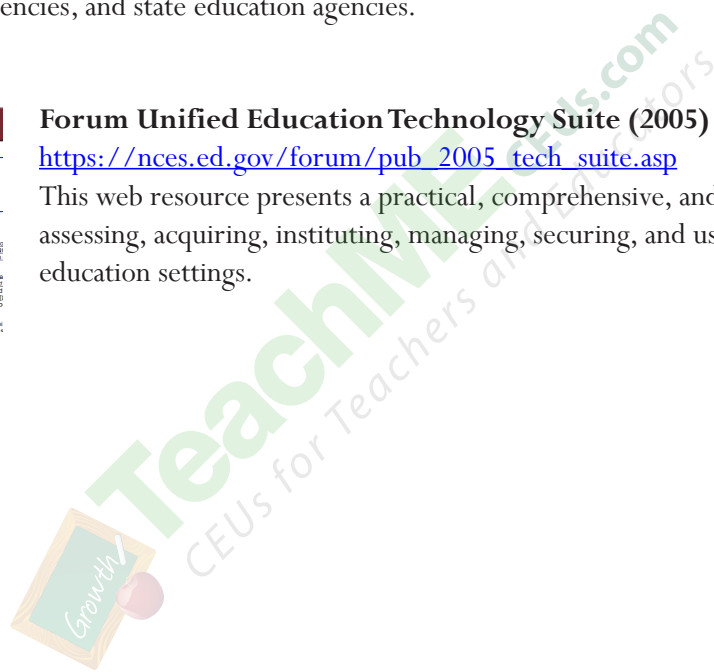https://nces.ed.gov/forum/pub_2013801.asp
This guide provides practical information about the knowledge, skills, and abilities needed to identify, access, interpret, and use data to improve instruction in classrooms and the operation of schools, local education agencies, and state education agencies.



## Forum Unified Education Technology Suite (2005)
https://nces.ed.gov/forum/pub_2005_tech_suite.asp
This web resource presents a practical, comprehensive, and tested approach to assessing, acquiring, instituting, managing, securing, and using technology in education settings.