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Advancing Personalized Learning through Effective Use and Protection of Student Data

BY WILLIAM TUCKER AND DON LONG

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Advancing Personalized Learning through Effective Use and Protection of Student Data

By William Tucker and Don Long

With roots in student-centered pedagogies that go back at least to the 1900s, personalized learning meets students' learning goals, needs, context, and pace while incorporating their interests and preferences. Personalized learning in today's classroom depends upon and creates an abundance of rich student data, which simultaneously fosters new opportunities for learning and creates fresh concerns over student data privacy.

On the one hand, data to support personalized learning are used to monitor student progress and support customized instruction in real time. They also aid in evaluating students, teachers, and programs over longer periods. Digital tools make it easier to customize instruction and assessment for continuous improvement, expand access to a wealth of content and experiences, and engage students through a greater variety of modalities of learning. Empowered by data, students, parents, leaders, and teachers can individually and collectively match individual supports and opportunities to student strengths and needs.

Linda Howard, a sixth-grade English teacher in Fall River, Massachusetts, describes her approach to personalized learning, where students rotate between working online and face to face: "I get to work with small groups a lot more. I understand my kids so much better now," she said. "Working with them individually and having their data from i-Ready [one of the school's digital content providers] has really opened my eyes to each kid's strengths and weaknesses."[1]

On the other hand, personalized learning relies increasingly and heavily on digital technologies to gather and store student data. The technologies thus intensify concerns about commercial influence in education generally and about third-party access to and potential misuse of student data in particular. As authors from the National Education Policy Center put it: "As schools continue to integrate technologies into every aspect of school life, those technologies are being harnessed to amplify corporate marketing and profit-making, extending the reach of commercializing activities into every aspect of students' school lives."[2]

This panoply of possibilities and concerns creates a challenge for policymakers.[3] Numerous state and federal laws exist to protect student privacy and ensure that student data are not shared inappropriately. These policies, however, have been established piecemeal over time, creating confusion for schools that want to implement personalized learning models.

Existing federal laws—the Family Educational Rights and Privacy Act (FERPA), the Protection of Pupil Rights Amendment (PPRA), and the Children's Online Privacy Protection Act (COPPA)—have proved difficult to keep up to date as technology changes. While the federal law plays a critical role in providing a broad framework, it can only supplement the states' role in developing consistent and coherent policies, suggests the Data Quality Campaign.[4] States are better positioned to develop laws that reflect state priorities and values and that incorporate diverse stakeholder views on how best to balance data access and privacy.

States have passed a slew of legislation in recent years to address student data privacy. Since 2013, 49 states have introduced 503 bills, and 41 states passed 94 laws on the privacy and security of student data, according to the Data Quality Campaign.[5] In 2017, data access and privacy continued to be a focus, with 107 bills being introduced by 38 states, and 30 passed into law (see map). Although these laws are not uniform in scope or aim, they govern what sorts of data may be collected, who may access that data, and how student information may be used.

Each of these new laws increased student data privacy protections, making the collection of specific pieces of student information more difficult for classes of interested parties. The tug-of-war over student data may sometimes be a zero-sum game: Increased protection on one side may result in a corresponding loss of access on the other. Overreaching in this space can increase security surrounding student records at great cost in terms of lost opportunities for learning.

The most progressive laws and policies allow parents and students the autonomy to make decisions. At a minimum, schools and districts that allow personalized learning programs should ensure that student information is shared in a secure way that respects student privacy and is no more invasive than necessary to achieve a learning goal. At the same time, students and parents should be able to opt into such an exchange—a policy that fosters trust and encourages involvement.

The best laws and policies also recognize the value inherent in personalized learning and provide infrastructure for safe access to a predetermined, transparent set of

data. Such policies advance both access and protection and stand in contrast to laws and policies that unilaterally restrict opportunities to participate. The constant flow of new applications that use student data as avenues for increasing student achievement calls for laws and policies that leave room for growth and innovation. In contrast, policies that restrict data use run the risk of stifling innovation and preventing students from realizing its benefits.

The coupling of states' commitment to preparing all students for postsecondary success with technological innovation makes personalized learning possible at an unprecedented scope and scale. Interest is rising in districts, at the federal level, and in the philanthropic community. The U.S. Department of Education has provided over half a billion dollars to districts in support of personalized learning. The Bill & Melinda Gates Foundation has committed $300 million since 2009 to support research and development, and the Chan Zuckerberg Initiative in 2015 promised to invest substantially in personalized learning across multiple fronts. In addition, more than 3,100 district leaders have signed the "future ready pledge," sponsored by the Alliance for Excellent Education to help districts achieve college- and career-ready goals for all students. With it, the districts commit to transforming instruction through leveraging technology to personalize learning in the classroom.

The intensifying demand for personalized learning raises the stakes for states and districts to develop policies that support the timely, effective use and protection of the student data that are fundamental to its success. It is also imperative to eliminate policies that impede personalized learning.

WHY PERSONALIZED LEARNING?

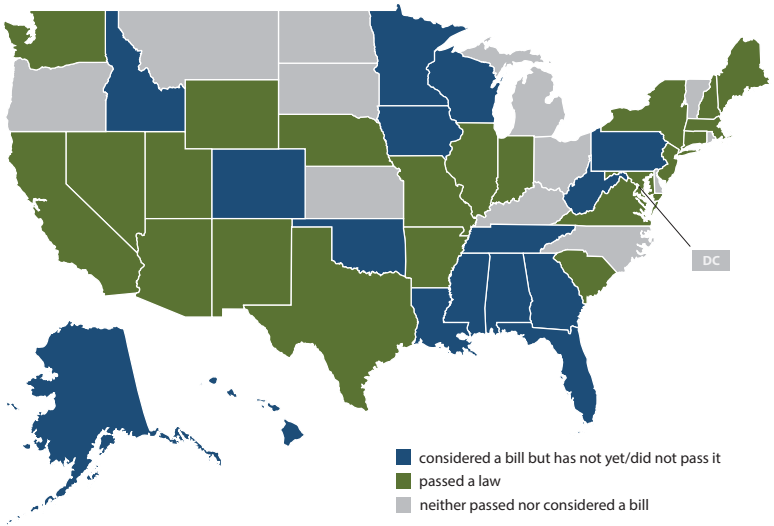
To understand the urgency for effective state policies to address the data privacy concerns raised by personalized learning, it is essential to understand personalized learning's promise and challenges. In 2015, RAND found that students attending schools with robust personalized learning models "made gains in mathematics and reading over the past two years that were significantly greater than a comparison group made up of similar students."[6] Students were also more likely to report they had engaged in complex, student-centered instruction. Increased graduation and college completion rates were associated with school districts implementing these innovative school models.

In a 2017 study looking at a different sample of schools with less experience with personalized learning, RAND researchers found that implementation varied considerably across schools and resulted in less significant student gains. The schools with the most improved student outcomes were those that implemented all of the following: grouping students by data to meet their needs, using data to engage students in reflection of their learning progress and goals, and providing environments that supported the personalized learning model.[7] One conclusion is that context and implementation—the "how"—matters. Similarly, a report of the National Center for Learning Disabilities found many benefits for students in special education from personalized learning, each with an accompanying implementation challenge.[8]

It is also important to put the "why" of personalized learning in an equity context. Despite its aspirations for the success of all students, the U.S. education system remains unique among developed nations in giving the least to those with the least.[9] International data show that the nations that make the greatest investments in the education of their most disadvantaged students also have the highest performance on the Programme for International Student Assessment (PISA) tests.[10]

Compared with their more advantaged peers, high-poverty and minority students in the United States are more likely to be food insecure, more fearful for their safety inside and outside of school, and face higher levels of educator turnover that deprive them of consistent adult relationships in school.[11] These students have disproportionately less access to technology and out-of-school experiences that can be leveraged to facilitate student-centered pedagogies like personalized learning.[12] Along with higher levels of need, they experience lim-

States That Considered and Passed Laws to Guarantee Access or Protect Privacy in 2017



Source: Data Quality Campaign, "Education Data Legislation Review: 2017 State Activity" (September 2017).

ited access to high-quality leaders, teachers, and other staff, as well as infrastructure and programs, a situation that poses significant obstacles to personalizing learning using best practices. The renewed interest and experimentation in personalized learning must be grounded in fully addressing these equity challenges (box 1).[13]

WHAT IS PERSONALIZED LEARNING?

As is to be expected in any period of transition and creative ferment, there are competing definitions of personalized learning, each placing different emphases on the roles of students, teachers, and technology. Although almost universally praised, personalized learning has not generated consensus around any one definition.[14] For years, the term personalized instruction was not distinguished from individualized or differentiated instruction. More recently, terms such as "deeper," "student-centered," or "blended" are used interchangeably with "personalized" and add to the confusion of those trying to analyze its utility and operationalize it in classrooms.[15]

Earnest yet largely inconclusive attempts to crystallize the term have prompted some to call for a moratorium on further attempts.[16] But there are several excellent candidates for a consensus definition (box 2).

The lack of clarity in defining personalized learning is consequential. It impedes policy development and alignment across all components of an education system—curriculum, materials, assessment, accountability, and leaders and teachers—which are needed for scaling and sustainability.[17] And where personalized learning is absent from the classroom, educators are forgoing "a way to engage and motivate young learners, deepen their interactions with academic content, and achieve the positive outcomes that pave the way to long-term success."[18]

The multiple definitions or sets of criteria for personalized learning provide a dynamic and multifaceted but confusing amalgamation of competing values, interpretations, and uses, each emphasizing different educational goals and purposes, attributes, and learning environments. At the same time, personalized learning may place unrealistic demands on teachers and leaders, who already face increasing expectations and responsibilities. The typical U.S. schoolroom has an average 1:19 teacher-student ratio.[19] That one teacher is expected to convey a body of content to each of the increasingly diverse group of students in a classroom within a limited period—all while cultivating a set of skills and dispositions. Leaving personalized learning amorphous and unclear therefore not only hinders policy and research but also may undermine educator and public interest and support.

DIGITAL TECHNOLOGY AND PERSONALIZED LEARNING PLANS

Personalization occurs as a matter of course in classrooms throughout the country—with and without the aid of digital tools. But it is hard work to give each student a different "touch" to guide their learning, so many students do not experience personalization regularly or at all.[20] In a 2005 study on a related student-centered pedagogy, differentiation, the National Research Center on Gifted and Talented found that "the 'vast majority' of teachers never moved beyond traditional direct lectures and seat work

[BOX 1]

Policy Recommendations for Equal Access to Personalized Learning

- Expand and improve high-speed, broadband connectivity to ensure student opportunities for anytime, anywhere learning by
  - examining contracting strategies and pooled purchasing agreements to support cost-effective contracting for schools and districts;
  - allowing any K–12 education program in the state to buy off of statewide enterprise contracts to maximize telecommunications investments with public dollars and E-Rate funds; and
  - exploring state strategies to make free or discounted broadband connectivity available to economically disadvantaged students at home and in their communities for anytime, anywhere learning.
  - supporting the development of data systems aligned to personalized, competency-based learning.
- Develop state data systems to collect, in real-time, standards-based, baseline and longitudinal data to measure student growth over time to promote continuous improvement.
- Ensure content, learning materials and professional development resources created with public funds are made publicly available as OER.
- Include OER on approved state instructional materials lists and support the development and maintenance of openly licensed instructional materials aligned with state standards.
- Establish policies for the protection and good governance of student data privacy and avoid prohibitions that could have unintended consequences for the ability of educators to personalize learning.

Source: iNACOL, "**Meeting the Every Student Succeeds Act's Promise: State Policy to Support Personalized Learning**" (Vienna, VA: 2016).

for students."[21] The challenges to personalizing learning include lack of proper teacher and leader preparation, professional learning, and ongoing support. In addition, educators face complex realities: large class sizes, limited materials, lack of time for planning and collaboration, and an expanding scope of responsibilities.

Digital technology can address these constraints and ramp up the opportunities for customization. Because they are best positioned to measure the relative impact of personalization techniques, teachers tend to be the biggest proponents of personalized learning platforms. According to a Bill & Melinda Gates Foundation survey in 2015, "The majority of teachers reported that they believe that data and digital tools make them better teachers," and "nearly 7 in 10 teachers (69 percent) surveyed believe that tailoring instruction to meet the needs of individual students is required to improve student achievement."[22] According to a Rhode Island Personalized

[BOX 2]

Defining the Term

Online-learning association iNACOL defines personalized learning as "tailoring learning for each student's strengths, needs, and interests—including enabling student voice and choice in what, how, when, and where they learn—to provide flexibility and supports to ensure mastery of the highest standards possible."[a]

Another approach is to identify defining characteristics of personalized learning:

- begins with the individual learner and their journey; each learner brings their unique history and context to each experience;
- frequently motivated by relationship and activated in community;
- occurs most fully when it engages all of a student's senses, emotions, and intentions;
- learners bring unique interests, motivations, and ways of learning.[b]

The Rand Corporation has developed criteria for identifying personalized learning:

> Leading practitioners in the field generally look for the following: (1) systems and approaches that accelerate and deepen student learning by tailoring instruction to each student's individual needs, skills, and interests; (2) a variety of rich learning experiences that collectively prepare students for success in the college and career of their choice; and (3) teachers' integral role in student learning: designing and managing the learning environment, leading instruction, and providing students with expert guidance and support to help them take increasing ownership of their learning.[c]
>
> "Personalizing learning," the term preferred by David Hargreaves, emphasizes that it is a process, not a thing.[d]

Jobs for the Future compiled, synthesized, and analyzed hundreds of research articles to ground its four overlapping, complementary principles of "student-centered, personalized education":

- **personalized:** providing learners with high-quality instruction customized to their needs and interests and emphasizing connection between personal relationships and learning;
- **competency-based:** enabling learners to advance to the next level, course, or grade based on demonstrations of their skills and content knowledge;
- **anytime, anywhere:** providing learners with opportunities to learn outside of the school and the typical school day; and
- **student-owned:** encouraging and supporting learners to take an active role in defining their own educational pathways.

In sum, personalized, learner-centered approaches (the "how") are the way to achieve deeper learning competencies (the "what") in order to prepare all students for meaningful work, lifelong learning, and civic participation.[e] This understanding can guide a systemic approach to personalized learning that can guide policymaking.

a. Susan Patrick et al., "**Defining and Integrating Personalized, Blended, and Competency Education**" (Vienna, VA: iNACOL, October 2013).

b. Tom Vander Ark, "15 Dimensions of Personalized Learning," *Getting Smart* blog (September 12, 2017), **http://www.gettingsmart.com/2017/09/15-dimensions-of-personalized-learning/**.

c. John. F. Pane et al., "Continued Progress: Promising Evidence on Personalized Learning" (Santa Monica, CA: Rand Corporation, November 2015), on file with author.

d. David Hargreaves, "**The Final Gateway: School Design and Organisation**" (London: Specialist Schools and Academics Trust, 2006).

e. Rebecca E. Wolfe et al., **Anytime, Anywhere: Student-Centered Learning for Schools and Teachers** (Boston: Harvard Education Press, 2013).

Learning Initiative white paper, "Teachers recognize that a one-size-fits-all instructional model is inequitable and not aligned with the educational needs and rights of individual students."[23]

A former Google executive and current CEO of learning company Gooru, Prasad Ram, explains the dynamic of technology and metadata this way: "At every interaction, Gooru captures usage data, social signals, and learning outcomes, which are used to develop user profiles, inform recommendation algorithms, and provide teachers with tools to deliver personalized learning to their students."[24] Companies like Gooru provide tools to apply "big data" principles to "transform the small classroom."

Even as personalized learning platforms become the "new normal," the technology and techniques behind these tools continue to develop, and thus so do the data that will inform teachers and students.[25] For example, DreamBox, makers of an adaptive learning tool, claim it personalizes student learning by producing multiple pathways for student achievement. An adaptive learning system "simultaneously assesses and instructs in real time and tracks the millions of data points that it collects so that it can provide real-time reporting for teachers and administrators."[26]

Effective communication is critical, especially since schools that have incorporated personalized learning strategies have relied on a mix of digital platforms. As one personalized learning company executive put it, "The secret to successful implementation is an open, engaging, and ongoing partnership between technology providers, administrators, and most importantly the teachers within a school or district."[27] This feedback loop is impossible without a steady flow of information. Indeed, information is the linchpin of personalized learning.

When configured well, personalized learning technology gives teachers insights into student needs and lets them track each student's progress. With the data produced from student interactions with the technology, teachers "can more precisely pinpoint what students know and where they are still struggling at the moment they are struggling" and "can then use that information to drive better learning."[28]

Personalized learning plans (PLPs) help schools and districts implement personalization. For example, California's Thrive Public Schools and Summit Public Schools incorporate student career goals, yearly performance, and academic plans in their PLPs.

Vermont has incorporated PLPs into its broader education strategy. Under its flexible pathways law, the state works with every student in grades 7 through 12 in an ongoing process that yields, among other things, a PLP for achieving graduation and postsecondary and career goals.[29] Students revisit these plans at several points. The resulting PLPs include a student profile with self-identified strengths, weaknesses, interests, and core values; personal goals, current and beyond K-12; steps needed to achieve the personal goals; graduation requirements; and an academic plan based on the student's expectations and goals.

CICS West Belden, a K-8 charter school in the Chicago International Charter School (CICS) network, addressed a problem with plateaus in performance by adopting a PLP that combines student profiles and online platforms and focuses on social and emotional learning (SEL).[30] West Belden used a ticket system to track traits linked to goal setting and self-direction and rewards students for demonstrating instances of "PRIDE": problem solving, responsibility, integrity, drive, and empathy.

By tracking SEL as well as academic data from both the online platforms and the PRIDE system, West Belden could quantify the impact of its program and report those results to its board, parents, and students. The school allots two hours a day for teachers to analyze the student data to identify opportunities for targeted small-group instruction and student strengths and weaknesses. Such a big allotment of time is necessary for at least two reasons. First, differentiated instruction should be more efficient than undifferentiated instruction, opening up more time for teachers to conduct data analysis. Second, data analysis exercises help ensure that student data are collected and used for a targeted, legitimate instruction purpose. This intentionality is an important part of responsible student data use and student data privacy.

STATE POLICIES SUPPORTING PERSONALIZED LEARNING

Rich student data provide a picture of the whole student—where they are in their learning progressions; their strengths, interests, and needs; and where they need to grow. While data of the variety described above can inform academic choices and career goals, those who view personalized learning with a wary eye are more likely to be concerned about two things: biometrics and the metadata that result from student interactions with the many dashboards and platforms found among the spectrum of personalized learning tools. Student records that contain such information are arguably more sensitive than academic performance data or a few sentences on career aspirations in a PLP.

Biometrics refers to the measurement of individual physiological and behavioral characteristics. In addition to the classic biometric identifier, the fingerprint, there are many identifiers potentially associated with personalized learning: voice recordings, facial recognition, and eye movement and motion trackers.[31] Such data are incredibly personal—but for those seeking to individualize education, that's the idea. The prospect of ungoverned access to these data has raised serious concerns and corresponding advocacy and policy recommendations to address the lure of "personalization" in the context of technology advances, lax regulation, and the collection of enormous amounts of personal data that "overwhelm efforts to protect children's privacy."[32]

To advance personalized learning, state policymakers need to develop laws and policies that balance data privacy concerns with efficient, effective access to data for leaders, teachers, parents, and students.

The Every Student Succeeds Act (ESSA) has given states and districts more latitude to lead and innovate and represents a dramatic opportunity for states interested in personalized learning strategies. According to Richard Culatta, Rhode Island's chief innovation officer, "With [ESSA's] additional flexibility, we are up at the front of the line taking advantage of it."[33] Indeed, states are in the driver's seat, because for their part, and with few exceptions, the federal government is prohibited under several statutes from collecting, and creating a database of, personally identifiable student information (PII).[34] Consequently, individual states are responsible for collecting, storing, and processing student data.

Yet several states have passed laws that unwittingly hamper personalized learning by preventing teachers from accessing information about their pupils' progress. The impetus behind these moratoriums is a desire to protect student privacy. In contrast, other states have developed secure approaches for using student data to inform personalized learning while taking privacy concerns seriously. To guide state legislation on a systems approach to effective use of data, the Data Quality Campaign advocates for four priorities: 1) measure what matters; 2) make data use possible; 3) be transparent and earn trust; and 4) guarantee access and protect privacy.[35]

Successfully integrating student data privacy and access to student information unlocks the true potential of personalized learning—leveraging teachers' full potential while putting students on a trajectory to realize their own. Select states are instructive in this regard. Louisiana, California, and Kansas provide instances of addressing privacy concerns without hamstringing potentially beneficial uses of data in the classroom. Florida and New Hampshire offer case studies of well-intentioned restrictions that smother opportunity yet offer little progress on protecting student privacy in exchange.

Louisiana

Louisiana has two main student data privacy laws: LSA R.S. 17 § 3914 and § 3913. The latter concerns the transfer of student PII and deals mostly with the transparency of the state's student data practices. The former law defines PII as "information about an individual that can be used on its own or with other information to identify . . . a single individual."[36] This information includes "[a]ny information that can be used to distinguish or trace an individual's identity such as . . . biometric records . . . [and] any other information that is linked or linkable to an individual such as medical, educational, . . . and employment information." The act then states that PII shall not be provided to any entity, public or private.

The law allows five exceptions to this prohibition. The four most relevant are 1) a student's unique ID number;[37] 2) student PII provided to the state's department of education for "satisfying state and federal assessment, auditing, funding, monitoring, program administration, and state accountability requirements" that has been aggregated to the point where it is deidentified; 3) student PII to "any person or public or private entity" after written authorization by a parent/legal guardian, student upon reaching the age of legal majority, or person otherwise authorized by the state, so long as that information shall remain confidential, the intentional breach of which will expose the actor to civil and criminal liability;[38] and 4) to allow for the transfer of student information, such as in the case of a student transferring from one school district to another. Moreover, the law also allows for access to certain limited "student information" based on the user's role.[39]

Finally, the law allows for school districts to contract with private third parties to provide them with student information for "student and other education services," provided that these third parties limit the handling and disclosure of such data to the four corners of the contract between the third party and the district. The law provides six minimum requirements for these contract provisions: 1) guidelines for student information access and authorization; 2) privacy compliance standards; 3) internal privacy and security audits; 4) data breach planning, notification, and remediation procedures; 6) data governance policies for information storage, retention, and disposition; and 6) a provision for the deletion of all data held by the contractor upon termination of the contract. Violation of any of these provisions could lead to serious criminal and civil liability.

Three aspects mark Louisiana's commendable approach to student data privacy. First, the law acknowledges students' right to privacy in their personal information and backs up that proposition with criminal and civil penalties for breaches. Second, the state appropriately takes the position that the disclosure of data is a decision that should be left up to the affected individual and made on a case-by-case basis. Third, Louisiana law puts pressure on the state, districts, and the entities with which they contract to ensure that appropriate security and privacy precautions are accounted for in any agreements between the parties. Importantly, the law emphasizes the use of modern security and privacy protections without being overly prescriptive, allowing for follow-on policies that adapt to changes in standards and best practices in a manner that legislation cannot. The result is an approach that relies on such best-practice principles as adopting data use restrictions and differentiating between levels of data sensitivity while avoiding a game of Whack-A-Mole or outright bans. In combination with transparency regarding what data are collected and how they are used, Louisiana's strategy

allows students a level of personalization they find appropriate.

California

California's new student data privacy law is seen as the most comprehensive state effort to balance access and privacy concerns and offers promising ways to reconcile data privacy with multiple competing interests such as educational research, technology innovation, and industry. Praised as solutions to "a growing problem of mismanagement of student data,"[40] California passed two bills in 2014 that have had major implications for student data governance. The first of these, California Assembly Bill 1584, concerns the privacy of student records with regards to third-party operator contracts.[41] The law requires that contracts entered into with third parties include specific provisions, including a "statement that the pupil records continue to be the property of and under the control of the local education agency (LEA), [and] a description of the actions the [third party] will take to ensure the security and confidentiality of pupil records." In addition, failure on the part of third-party contractors to comply with the provisions contained within the statute will result in the contract to use the student data becoming void.

AB 1584 defines pupil records to include "any information acquired directly from the pupil through the use of instructional software or applications assigned to the pupil by a teacher or other local educational agency employee." However, it excludes deidentified information that is used to "improve education products for adaptive learning purposes and for customizing pupil learning," as well as deidentified data used to either demonstrate product effectiveness for the operator's marketing purposes and for "the development and improvement of educational sites, services, or applications."

The second relevant student record law from California is known as the Student Online Personal Information Protection Act (SOPIPA).[42] This is considered a model law for addressing the issue of educational data mining (EDM), the increasingly sophisticated use of data analytics that has generated many innovations in educational software and student learning.[43] The challenge is to enable research and development of high-quality solutions in academia and industry—and validation of their effectiveness—while protecting student privacy. Although they are intended to protect students, complete bans on retention of personally identifiable information (PII), or requirements to delete all data after specified periods, may actually do harm by impeding innovation that can lead to advances in EDM to improve student outcomes. Instead, as recommended by EDM expert Ryan Baker, "PII mappings should be held in trust by school districts or by other entities, under careful control, but used when there is a good justification for benefit and careful controls of privacy."[44]

When SOPIPA was passed (as Senate Bill 1177), it was labeled one of the most aggressive protections for student data in the country and as a potential nationwide legislative model.[45] SOPIPA has proved popular: 25 states modeled their student records legislation after it in 2015, and more such legislation followed in subsequent legislative sessions.[46] Since 2014, 21 states passed laws based on SOPIPA.[47]

SOPIPA applies to operators of websites and online and mobile apps that cater to K-12 schools.[48] Subject to a few discrete exceptions, SOPIPA prevents these operators from leveraging their access to student data to "knowingly engage" in a range of activities prohibited by the statute, including targeted advertising, amassing student profiles, selling, or otherwise disclosing covered student information. The law also requires operators to protect and secure student information through the implementation and maintenance of "reasonable security procedures and practices appropriate to the nature of the covered information." Finally, SOPIPA contains a deletion clause requiring operators to delete covered student data if requested by a school to do so.

Despite these rigorous protections, SOPIPA does not completely divest operators of benefits inherent in the student data they possess. For example, an operator is permitted to use deidentified student data to improve its own products or to demonstrate, through marketing or otherwise, the effectiveness of their product or service. In addition, the law does not prevent companies from directing marketing efforts at parents, so long as those efforts do not stem from PII that such companies may have obtained from students. Nor does the law hinder operators from using student data, including PII, "for adaptive learning or customized student learning purposes"—such as personalized learning.

Kansas

Kansas's Student Data Privacy Act was passed into law in 2014 to address gaps in student data privacy protection. Unlike the legislation in Louisiana and California, the act specifically defines "student data" and "personally identifiable student data."[49] The statute provides that student data may be disclosed to a service provider of a state or local education agency "engaged to perform a function of instruction, assessment or longitudinal reporting, provided there is a data-sharing agreement between the [SEA or LEA and the] service provider." The statute further states that the agreement must contain at least four provisions: 1) purpose, scope, and duration of the agreement; 2) that the recipient of the student data use such information solely for the purposes specified in the agreement; 3) that the recipient shall comply with data access, use, and security restrictions specifically described in the agreement; and 4) that the student data shall be destroyed when no longer necessary or upon the expiration of the agreement.

The Kansas statute makes allowances for teacher as well as other LEA or SEA

employee access to student data based on need and user roles. Moreover, it addresses the collection of student biometric data: "No school district shall collect biometric data from a student, or use any device or mechanism to assess a student's physiological or emotional state, unless the student, if an adult, or the parent or legal guardian of the student, if a minor, consents in writing."[50]

Florida

Unlike the states discussed above, whose protection of student data provides avenues for personalized learning, Florida effectively closes the door. Under a 2014 law, an agency or board may not "[c]ollect, obtain, or retain information on the political affiliation, voting history, religious affiliation, or biometric information of a student or a parent or sibling of the student."[51] The law defines biometric information as "information collected from the electronic measurement or evaluation of any physical or behavioral characteristics that are attributable to a single person." This list includes "fingerprint characteristics, hand characteristics, eye characteristics, vocal characteristics, and any other physical characteristics used for the purpose of electronically identifying that persona with a high degree of certainty." The law furthermore provides that examples of such biometrics might include "a fingerprint or hand scan, a retina or iris scan, a voice print, or a facial geometry scan."

The technologies teachers rely on to help personalize learning could well qualify as biometric information under Florida's statutory definition and therefore be banned. Because lawmakers included no statements on personalized learning itself, an intentional ban seems unlikely. Yet the effect on classroom use is the same.

New Hampshire

Under New Hampshire's student data privacy law, the SEA may neither collect nor maintain a comprehensive list of student data.[52] Furthermore, the state prohibits the collection and storage of student biometric information. Although the state prohibits collection of student height, body mass index, and weight separately, New Hampshire defines other biometric information as "a record of one or more biological or behavioral characteristics that can be used for automated recognition of an individual."

Another New Hampshire statute governs student online personal information. Under this law, operators of online websites, services, applications, and mobile apps with "actual knowledge that the site, service, or application is used primarily for K-12 school purposes and was designed and marketed" for such purposes are prohibited from knowingly engaging in several actions with personally identifiable student information, including targeted advertising or using the information to amass a profile about the student.[53]

In effect, the New Hampshire law protects against the extremes of student data exploitation at the expense of more nuanced, academically beneficial uses. The state arguably achieves its aims of protecting students by preventing the "sale, lease, rent, trade, or otherwise" of student data. In conjunction with its ban against using student data for targeted advertising, the law essentially limits the use of any collected data to strictly educational uses.

However, the law goes too far by preventing companies from, for example, amassing a profile about students through the use of any information, including deidentified data, as no such distinction is made. Such profiles underlie efforts to differentiate learning from one student to the next. It may indeed be laudable to prevent education technology companies from using the DNA of New Hampshire students for educational purposes. But a broad definition of biometric data and an outright ban on the collection of all but a few traditional data points (such as height and weight) prevent New Hampshire foreign language students, for example, from using learning software that evaluates their effectiveness at speaking the language and other students from using software that stores images of student handwriting, which can range from essay drafts to math equations to attendance checkmarks. All of it is "biometric data."

LESSONS LEARNED

What divides legislation that fosters personalized learning from laws that hamstring it is clear. Legislation that stymies personalized learning programs takes choice away from parents and students regarding their learning opportunities. Laws that take a more measured approach let schools track student information with the proper consent of students and parents and thereby give space for personalization to schools, districts, and organizations working with them.

New Hampshire's state law is among the greatest offenders, with its heavy-handed provisions to prevent critical student data from being stored and analyzed in their state longitudinal data system (SLDS). There is no doubt that the law is well intentioned and contains some sound provisions, such as protecting information on student sexual orientation, credit card accounts, and political affiliations. Other provisions, however, go too far.

Consider the state's policy on data collection. First, the policy lacks a provision to allow a parent, guardian, or student to opt in to educational programs that might require the collection and analysis of student information that the state bars. Second, its definition of biometric information is much too broad and effectively throws the baby out with the bathwater.

Furthermore, restricting the collection of "behavioral characteristics" that might be used for automated recognition of an individual would likely prevent a school from collecting metadata from an online tutoring program, for example.[54] This would prevent SEAs, researchers, and thus

students themselves from benefiting from a range of detailed feedback on their learning.[55] As confusingly broad as the "behavioral characteristics" restriction is, another provision of New Hampshire's law piles on, preventing online or mobile services from using information that could be used to personally identify a student.[56]

New Hampshire's prohibition on sharing information that could be linked to a particular student in effect prevents personalized learning from occurring at all. Simply put, if these tools cannot identify a student's input or responses, they cannot personalize the education experience.

New Hampshire officials have nonetheless expressed their desire to implement personalized learning programs in the state's schools—an effort that the U.S. Department of Education describes as "a high school redesign that replaces the time-based system (Carnegie unit) with a competency-based system focused on personalized learning, strong teacher-student relationships, flexible supports, and development of 21st century skills."[57] As other states have done, New Hampshire plans to deploy a personalized learning plan template. Interestingly, the template appears to ask for information that state law prohibits its SEA from collecting.[58]

Florida's law is similarly well intentioned and similarly short-sighted. While it does not restrict student data collection and use to the extent that New Hampshire's does, it is particularly restrictive on the collection of biometric records. As one of the most sensitive categories of student information, its protection should be a high priority. Indeed, one can easily imagine why parents, students, and their state representatives might feel the need to limit the ability of schools or third parties to collect and store facial geometry or iris scans. However, by preventing the SEA or affiliated institutions from collecting and evaluating "information collected from the electronic measurement or evaluation of any physical or behavior characteristics that are attributable to a single person," Florida also prevents families from making decisions about their data and potentially withholds opportunities from students. The law fails to leave room for perfectly appropriate and frankly exciting ways to leverage a student's information for their academic benefit.

There is another way forward—one that is both responsible and avoids taking a hands-off approach to potentially exploitative uses of data. While this report focuses on data privacy, policymakers should address the full range of issues to enable equal access for all students to high-quality personalized learning.

As discussed above, Louisiana is an example of a state approach that is quite restrictive with its students' biometric records but lets parents and students choose whether to opt into such data collections. They thus protect their students while leaving it up to them and their families to determine their level of comfort with the information they share.

The problems Florida and New Hampshire's laws seek to prevent could further be avoided with an explicit statement like that in California's SB 1177, which regulates the collection of biometric and other personally identifiable information but affirms that nothing within the law should be read to limit personalized learning. Finally, Kansas's law, which has provisions that define both personally identifiable student data and biometric data like Florida and New Hampshire's, provides room for personalized learning by employing the same strategy as Louisiana and allowing parents and students to opt into data use and collection. Kansas further balances privacy protection and promotion of personalized leaning by conditioning the state's use and analysis of student records it collects and maintains on compliance with strict (but not restrictive) predefined contractual agreements.

One additional model for state legislation is Illinois's Biometric Information Privacy Act (BIPA).[59] Although the law may not be a perfect solution, it addresses concerns that biometric data constitute a particularly sensitive variety of student data and thus should be treated differently from other student records. Rather than restrict what information can be collected—a strategy that likely will require regular updating as norms and values change—BIPA emphasizes consent. Under BIPA, private companies are barred from "collecting, capturing, purchasing, receiving through trade, or otherwise obtaining a customer's biometric identifier or biometric information unless it first" obtains the individual's written consent.

Furthermore, BIPA limits unintended consequences—something several other laws fail to achieve—by expressly excluding "writing samples, written signatures, photographs [and] human biological samples used for valid scientific testing or screening, demographic data, tattoo descriptions, or physical descriptions such as height, weight, hair color, or eye color." BIPA requires the company collecting and storing biometric data to have a written policy on storing and eventually destroying the data, a measure that could alleviate some security concerns on the disposition of student data. Although BIPA does not specifically address personalized learning or student records, it would govern third parties, including vendors that provide personalized learning platforms and technology, and it allows state boards of education the leeway to promulgate separate policies and regulations for state and local education agencies.

POLICY RECOMMENDATIONS

State boards of education have a responsibility to ensure the security of state and local student data collection. They also have the unprecedented opportunity through ESSA to "lead with equity," working with other state policymakers to enable personalized learning and technology innovation to improve student outcomes. They may fulfill these

dual responsibilities by ensuring compliance with existing laws, policies, and regulations; reshaping policy; and engaging public stakeholders to raise awareness.

Although state board and governance contexts may differ across states, boards are united in their role as the citizen's voice in education. They have three powers for leading in this role: policy, questioning, and convening. They can hold public and private convenings to discuss issues and pose questions to experts, state agencies, and community stakeholders. These powers are particularly important where overbearing legislation to impose data restrictions produces unintended consequences and threatens to stifle innovation. Moreover, convening is especially effective in states where the law requires general protections but leaves the specifics of implementation up to state boards and their state and district colleagues.

Yet many state boards of education paid little attention to data issues and personalized learning over the past year, according to NASBE's State Board Insight database, even as many state education agencies and state legislatures grapple with these issues. For example, education technology ranks low among topics on state board agendas.[60] In contrast to the frenzy of activity surrounding privacy and student data on the part of stakeholders and state legislators, only 14 state boards have discussed data generally since 2015, and only 4 discussed "alternative education" during the same period. In states such as Vermont, Texas, and Rhode Island, districts and schools have initiated many of the efforts to explore personalized learning. While boards have many important items on the agendas, they ought also consider data privacy issues in order to safeguard the access needed for realizing the promise of personalized learning for all students.

State boards can consider several key policies and actions to address these issues. First, boards should make personalized learning a strategic priority because it can dramatically improve academic performance, graduation rates, postsecondary outcomes, and teacher morale and because it affects protection of student data privacy and use of student information. State board members should build support for a shared vision of personalized learning. This can be accomplished, for example, by directing community and media attention to success stories of data use and personalized learning (box 3). They can also foster support and trust by inviting stakeholders to witness and visit districts that are engaged in personalized learning initiatives and that also have responsible, successful data protection strategies.

Tennessee's education department offers a leading model for boards to consider. Its Office of Personalized Learning works with school districts to support the use of virtual, distance, and blended learning models. This includes convening an Innovative Educator Network of 50 high-performing educators and librarians, along with experts and researchers, to discuss and implement personalized learning strategies.

Second, to raise public awareness, state

[BOX 3]

What Personalized Learning Looks Like

William Smith High School in Aurora, Colorado, serves a diverse group of 305 students (60 percent are disadvantaged) who seek a personalized education. Authentic, real-world problems and issues drive project-based learning and service learning opportunities. William Smith partners with the local University of Colorado Anschutz medical campus in health science programs, offers dual enrollments with community colleges, uses adjunct arts and fitness instructors, and requires seniors to complete a capstone project, in which they often have adult mentors from the community.

Teachers spend Friday afternoons collaborating and developing projects. Staff frequently adjust courses and schedules to flexibly allocate time as learning opportunities arise. Students are also involved in curriculum planning, and their inquiries often prompt subsequent topics of study with multi-grade-level classes. Teachers differentiate their instruction to accommodate all learners in each class, and all students have access to any course in which they are interested. Assessments are conducted in myriad ways, including showcases, community presentations, dramatic performances, Socratic seminars, and written portfolios.

Students of color and students who receive free and reduced lunch succeed at rates equal to, or higher than, the rest of their peers. The school boasts a 90 percent graduation rate—92 percent for minorities—and both of those rates are the highest in the district. "When we teach interesting things and engage kids in the work of professionals, learning will follow," said Principal David Roll.

Source: Drawn from Kevin Welner and Linda Molner Kelley, Answer Sheet blog, *Washington Post* (November 14, 2016).

boards should take a leading role in advocating for easy-to-understand information that helps parents and others learn how data are being used and protected. According to a September 2015 study by the Future of Privacy Forum, "Most parents believe that using student data, both in the aggregate and individually, is an appropriate (and perhaps constructive) way to evaluate and improve education." An overwhelming number of parents, 79 percent, believe that it is acceptable to use individual student data to personalize the learning process by identifying student strengths and weaknesses.[61]

With the renewed call in ESSA to engage the full suite of stakeholders, state boards can involve not just parents and students but also local policy and advocacy organizations and private companies in the personalized learning space to discuss how to achieve the best balance between protection and innovation. Building consensus for a shared vision of how data and privacy concerns should be managed in the context of education will undoubtedly provide the leverage to effect considerable positive change.

Third, many state boards have significant legal authority over education data privacy (Alabama, Utah, and West Virginia, for example) and should use it to ensure student data access and privacy. In addition, state boards can take advantage of their authority to pass binding and nonbinding resolutions, which almost all state boards of education have. This authority is most effective in situations where a law grants state boards the responsibility to clarify best practices and procedures or when changing technology and its applications have rendered a law out of date.

Student information can be a significant aid to academic growth and performance, but only if there is a sufficient degree of access to the data to spark that transformation. Without the key elements of trust and transparency, such a trade-off between access and protection cannot occur. When it comes to something as sensitive as student data, trust is not to be taken for granted, nor is it given lightly.

Fourth, boards should use their convening power to monitor and act on these issues. It is not easy but it is possible to earn the latitude that community trust affords—through transparent practices and protection of student data—and still allow for responsible information use to facilitate personalized learning. If classrooms are to pivot toward more personalized learning, it will take a collaborative effort. State board members are best positioned to bring together disparate stakeholders in the community, schools, and government for such collaboration.

They need not go it alone, as they can draw from many excellent resources. Multiple organizations and coalitions exist for the sole purpose of assisting schools and districts in achieving the responsible trade-off at the heart of this issue.

Finally, state boards can turn to 10 principles for using and safeguarding students' personal information, which NASBE aided in drafting (box 4). The principles reflect a vision centered around the effective use of data to support student learning and success and the critical importance of protecting that data. State board members can use these principles as a touchstone in their efforts to support personalized learning efforts and responsible data practices in their states.

The opportunities to accelerate student achievement through a more personalized learning experience are abundant. With the passionate involvement and vision of state boards of education, the promise of 21st century learning can be realized for each and every student.

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NOTES

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[BOX 4]

Ten Foundational Principles for Using and Safeguarding Students' Personal Information

- Student data should be used to further and support student learning and success.
- Student data are most powerful when used for continuous improvement and personalizing student learning.
- Student data should be used as a tool for informing, engaging, and empowering students, families, teachers, and school system leaders.
- Students, families, and educators should have timely access to information collected about the student.
- Student data should be used to inform and not replace the professional judgment of educators.
- Students' personal information should only be shared, under terms or agreement, with service providers for legitimate educational purposes; otherwise the consent to share must be given by a parent, guardian, or a student, if that student is over 18. School systems should have policies for overseeing this process, which include support and guidance for teachers.
- Educational institutions, and their contracted service providers with access to student data, including researchers, should have clear, publicly available rules and guidelines for how they collect, use, safeguard, and destroy those data.
- Educators and their contracted service providers should only have access to the minimum student data required to support student success.
- Everyone who has access to students' personal information should be trained and know how to effectively and ethically use, protect, and secure it.
- Any educational institution with the authority to collect and maintain student personal information should
    a. have a system of governance that designates rules, procedures, and the individual or group responsible for decisionmaking regarding data collection, use, access, sharing, and security, and use of online educational programs;
    b. have a policy for notification of any misuse or breach of information and available remedies;
    c. maintain a security process that follows widely accepted industry best practices;
    d. provide a designated place or contact where students and families can go to learn of their rights and have their questions about student data collection, use, and security answered.

Source: Data Quality Campaign.

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20. See, e.g., Richard M. Felder and Rebecca Brent, "Understanding Student Differences," *Journal of Engineering Education* 94, no. 57 (2005).

21. Cited in Sarah Sparks, "Differentiated Instruction: A Primer," *Education Week* (January 28, 2015). See also Monica R. Martinez and Dennis McGrath, who cite Philip W. Jackson's seminal work *Life in Classrooms* (New York: Holt, Rinehart, 1968) to support their point that the typical public school classroom remains static while the world evolves: "Philip W. Jackson wrote that students spend as much as 50 percent of their time waiting for something to happen. They wait for teachers to pass out papers. They wait for slower students to get their questions answered. They wait for the lunch bell to ring." Martinez and McGrath, *Deeper Learning*: *How Eight*

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35. Data Quality Campaign, "2017 State Activity."

36. LA R.S. 17:3914(B)(1).

37. These are not based on social security numbers and are used for state and federal reporting requirements. Ibid., (C)(2)(a), (C)(3).

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47. Data Quality Campaign, "2017 State Activity."

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49. K.S. SB 367 § 2(h). Student data are defined as (1) state and national assessment results, including information on untested students; (2) course taking and completion, credits earned, and other transcript information; (3) course grades and grade point average; (4) date of birth, grade level, and expected date of graduation; (5) degree, diploma, credential attainment, and other school exit information such as general education development and drop-out data; (6) attendance and mobility; (7) data required to calculate the federal four-year adjusted cohort graduation rate, including sufficient exit and drop-out information; (8) remediation; (9) special education data; (10) demographic data and program participation information; and (11) any other information included in a student's record.

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51. FL. Stat. § 1002.222(1)(a).

52. NH R.S. § 189.68(1)(a)-(v).

53. NH R.S. § 189.68-a(2)(a)(1)-(4). "K-12 purposes" refers to purposes that "customarily take place at the direction of the K-12 school, teacher, or school district or aid in the administration of school activities, including, but not limited to, instruction in the classroom or at home, administrative activities, and collaboration between student, school personnel, or parents, or are for the use and benefit of the school."

54. The statute differentiates between automated and nonautomated, as presumably one could match fingerprints of an individual whether or not one had automated help.

55. For example, if a student uses an online program to review school work, metadata could provide the student's teacher with information about answers the student selected before a final selection or where the student hovered their cursor arrow. Such information could help students discover why they made choices they did and help companies innovate.

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