A Solution-Finding Report

Title*: Personalized Learning*
Date: August 28, 2014

This solution-finding report provides information requested by the Michigan Department of Education related to Personalized Learning (PL) that addresses various levels of implementation, including the provision of various options for students as well as classroom-level considerations that demonstrate strategies and models for PL. This document would highlight the research behind PL and give educators an idea of how to design, implement, and evaluate PL at the classroom, building, and district levels. This tool could also serve as a resource for State Education Agency staff in providing guidance to locals that, when coupled with other implementation resources, provides a more comprehensive set of resources for educators.

According to the U.S. Department of Education (USDOE), "Personalization refers to instruction that is paced to learning needs, tailored to learning preferences, and tailored to the specific interests of different learners. In an environment that is fully personalized, the learning objectives and content as well as the method and pace may all vary (so personalization encompasses differentiation and individualization)." (http://www.ed.gov/technology/draft-netp-2010/individualized-personalized-differentiated-instruction)

Of note is the fact that the USDOE's Race to the Top–District (RTT-D) grant program, launched in 2012, states that, for any future Race to the Top awards made from any list of unfunded applicants, the USDOE would consider only applications that "meet Absolute Priority 1 and one of Absolute Priorities 2–5 described below" – with Absolute Priority 1 being *Personalized Learning Environment(s)*. According to the USDOE, "To meet this priority, the LEA or consortium's application must coherently and comprehensively address how it will build on the four core educational assurance areas (as defined in this document) in Race to the Top to create student centered learning environment(s) that are designed to: significantly improve teaching and learning through the personalization of strategies, tools, and supports for teachers and students that are aligned with college- and career-ready standards (as defined in this document); increase the effectiveness of educators, and expand student access to the most effective educators in order to raise student achievement; decrease the achievement gap across student groups; and increase the rates at which students graduate from high school prepared for college and careers" (see http://www.ed.gov/race-top/district-competition/absolute-priorities).

Although this report is broken down by subject, most of the reports would qualify to fall under more than one heading.

Solution-finding Reports are intended to provide a quick response to the request for information; they are not intended to be a definitive literature survey or synthesis of the topic.

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Center on
Innovations
in Learning   http://www.centeril.org/

From the U.S. Department of Education:

U.S. Department of Education. (n.d.). *Competency-Based Learning or Personalized Learning*. Washington, DC: Author.

http://www.ed.gov/oii-news/competency-based-learning-or-personalized-learning

According to this webpage, "Transitioning away from seat time, in favor of a structure that creates flexibility, allows students to progress as they demonstrate mastery of academic content, regardless of time, place, or pace of learning. Competency-based strategies provide flexibility in the way that credit can be earned or awarded, and provide students with personalized learning opportunities. These strategies include online and blended learning, dual enrollment and early college high schools, project-based and community-based learning, and credit recovery, among others." The page includes links to three state efforts, four district efforts, and two alternative/credit recovery schools and programs. The page also has three links to Additional Resources, the first two of which no longer work. The correct links are:

• Sturgis, C., & Patrick, S. (2010). *When Success Is the Only Option: Designing Competency-based Pathways for Next Generation Learning*. Vienna, VA: International Association for K–12 Online Learning.

http://www.inacol.org/cms/wp-content/uploads/2012/09/iNACOL_SuccessOnlyOptn.pdf

This paper is divided into three sections. The first section introduces a working definition for competency-based pathways that hopefully will be the beginning of creating a consensus of the characteristics of a high-quality approach to guide policy. The second section explores the driving forces behind competency-based innovations and implementation issues. The third section highlights a number of challenges facing states and districts as they explore competency-based approaches.

• Sturgis, C., Rath, E., Weisstein, E., & Patrick, S. (2010). *Clearing the Path: Creating Innovation Space for Serving Over-Age, Under-Credited Students in Competency-Based Pathways*. Vienna, VA: International Association for K–12 Online Learning.

http://www.inacol.org/cms/wp-content/uploads/2012/09/ClearingthePathReportJan2011.pdf

This paper provides guidance on creating competency-based approaches for students that have fallen off the track toward graduation. It claims, "Alternative school models that use aspects of competency-based approaches...are severely constrained by policies that rely on the Carnegie unit and other time-based system elements. The full benefit of competency-based alternative schools will remain unknown until enabling state policy conditions are in place."

• Wolf, M. A. (2010). *Innovate to Educate: System [Re]Design for Personalized Learning – A Report from the 2010 Symposium*. Washington, DC: Software & Information Industry Association.

http://siia.net/pli/presentations/PerLearnPaper.pdf

This report summarizes a two-day symposium – sponsored by the Software & Information Industry Association, ASCD, and the Council of Chief State School Officers – on the need for the systemic redesign of the K–12 education system to one that is centered on the personalized learning needs of each student, including recommended action steps.

Center on Innovations in Learning   http://www.centeril.org/

U.S. Department of Education, Office of Educational Technology. (2013). *Expanding Evidence Approaches for Learning in a Digital World*. Washington, DC: Author.

http://www.ed.gov/edblogs/technology/files/2013/02/Expanding-Evidence-Approaches.pdf

Chapter 2 of this report prepared for the U.S. Department of Education is entitled "Building Adaptive Learning Systems that Support Personalized Learning." It asks the question: "Advances in technology-based learning systems enable customized strategies and content. How can the learning data these systems collect be used to improve the systems' ability to adapt to different learners as they learn?"

U.S. Department of Education. (2012). *What Teachers Need to Know about Personalized Learning*. Washington, DC: Author.

http://www.ustream.tv/recorded/23903135

On July 10, 2012, the USDOE hosted a Teacher Summer Seminar on "What Teachers Need to Know about Personalized Learning." The seminar provided perspectives on the meaning, purpose, and future of personalized learning from USDOE staff, and teachers from Maryland and Virginia also shared how they use real-time data to individualize instruction and engage students with varied abilities. The above link is to the archived 90-minute video of the seminar. Links to the seminar's PowerPoint presentations (including *Overview of Personalized Learning* by Richard Culatta, *How to Personalize Learning in the Classroom* by Matt McCrea, and *Getting Started* by Patrick Ledesma) are available at http://www.ed.gov/teaching/summerseminars

U.S. Department of Education, Office of Innovation and Improvement. (2011). *Schools, Districts, and States Transform Seat-based Requirements into Competency-based Pathways to College- and Career-Readiness*. Washington, DC: Author.

http://www.ed.gov/edblogs/oii/2012/03/schools-districts-and-states-transform-seat-based-requirements-into-competency-based-pathways-to-college-and-career-readiness-2/

According to this article, "At the top of the ideas for increasing productivity is moving ahead with efforts to personalize learning, leaving behind an instructional system modeled on the American factory of the 20th century, one predicated on sorting out achievers from non-achievers. The advantages of individualized approaches, such as one-to-one tutoring, have been known since the 1980s, when Benjamin Bloom identified the 2 sigma problem. However, the costs of implementing them on a large scale have been prohibitive. With the recent advances in educational technology, American public schools increasingly have the means to respond to individual needs and learning styles and to turn the heretofore constants of time, place, pace, and curriculum into variables. The key, however, is to avoid the temptation of using technology as 'high-tech reproduction of current practice,' as Secretary [of Education Arne] Duncan observed in his remarks on the 'new normal.' Instead, technology can provide 'each person the tools they need to be more successful.'"

Research Supporting Personalized Learning:

American Institutes for Research. (2013). *Are Personalized Learning Environments the Next Wave of K–12 Education Reform?* Washington, DC: Author.

http://www.air.org/sites/default/files/AIR_Personalized_Learning_Issue_Paper_2013.pdf

This issue paper says that the USDOE's Race to the Top-District (RTT-D) grant program, launched in 2012, emphasizes personalized learning environments – "a new approach to understanding how and where education is delivered, how students learn, and the roles of teachers, parents, and the broader community in supporting students' academic success." This paper "examines the successful RTT-D applications to assess and learn lessons from this initial group of pioneering grantees' efforts to implement and scale teaching and learning innovations."

Center for Digital Education. (2013). *Pathways to Personalized Learning: Tapping the Potential, Realizing the Benefits*. Folsom, CA: Author.

http://images.erepublic.com/documents/CDE13+SRQ3.pdf

This report looks at the personalized learning movement sweeping through K-20 education. It presents research and firsthand accounts of how personalized learning is transforming the way we have traditionally viewed the educational model.

Clark, T. C. (2014). *Differences in Math Achievement: Utilizing Supplemental Computer-based Instruction and Traditional Instruction*. Unpublished doctoral dissertation, Liberty University, Lynchburg, VA.

http://digitalcommons.liberty.edu/cgi/viewcontent.cgi?article=1843&context=doctoral

The results of this study revealed that the Classworks math computer-based instructional program helped improve student achievement on the Criterion-Referenced Competency Test (CRCT) Math assessment.

Comprehensive School Reform Quality Center. (2006). *CSRQ Center Report on Elementary School Comprehensive School Reform Models*. Washington, DC: Author.

http://www.air.org/sites/default/files/downloads/report/csrq_0.pdf

This report from the Comprehensive School Reform Quality Center at the American Institutes for Research is intended to serve as a consumer guide that helps decision makers sort through claims about which approaches to comprehensive school reform (CSR) could truly meet the needs of students. It states that it is "the most extensive and comprehensive review of elementary school CSR models ever issued." A large number of the CSR models involve personalized instruction.

Comprehensive School Reform Quality Center. (2006). *CSRQ Center Report on Middle and High School Comprehensive School Reform Models*. Washington, DC: Author.

> http://www.air.org/sites/default/files/downloads/report/MSHS_2006_Report_Final_Full_Version_10-03-06_0.pdf

> This consumer guide from the Comprehensive School Reform Quality Center at the American Institutes for Research provides comparative ratings on the effectiveness and quality of 18 widely adopted middle and high school whole-school improvement models.

Headden, S. (2013). The Promise of Personalized Learning. *Education Next*, *13*(4), 14–20.

> http://educationnext.org/the-promise-of-personalized-learning/

> This 2013 article states, in part, "To date, there has been relatively little research on the effectiveness of blended learning in U.S. schools, and what research does exist cannot necessarily be generalized. A 2010 research review by the U.S. Department of Education found that students who took all or part of their courses online performed better on average than students who were taught face-to-face. The evidence also suggested that instruction that combined online and face-to-face methods was better than either method by itself."

Herlihy, C. M., & Quint, J. (2006). *Emerging Evidence on Improving High School Student Achievement and Graduation Rates: The Effects of Four Popular Improvement Programs*. Washington, DC: National High School Center.

> http://www.betterhighschools.org/docs/nhsc_emergingevidencebrief_111606final.pdf

> This brief is organized according to five cross-cutting challenges that high schools face in seeking to influence student outcomes. The larger lesson of this synthesis is that structural changes to promote personalization and instructional improvement are the twin pillars of high school reform.

Horn, M. B. (2014). Stop The False Generalizations About Personalized Learning. *Education Next*. Cambridge, MA: Program on Education Policy and Governance, Harvard Kennedy School.

> http://educationnext.org/stop-false-generalizations-personalized-learning/

> This 2014 article admits, "We need more research here, but the evidence seems to suggest that the achievement gap is exacerbated in the factory-model system when a student does not master a concept, develops holes in her learning, and the teacher just moves on to the next concept the next day. Instead, what we've seen in Chugach, Alaska and elsewhere, is that when we move to a competency-based learning system concerned with rigor—in which students move on to new concepts only upon mastery (and there exists the notion of a minimum pace so students who are falling behind get more attention and gaps don't grow too big)—that students who would typically be left behind and see their gaps grow bigger and bigger, instead experience a sea change when misconceptions are corrected, they master foundational knowledge and skills, and they can then accelerate much faster than anyone would have expected."

Jarrett, J. (2013). Bigfoot, Goldilocks, and Moonshots: A Report from the Frontiers of Personalized Learning. *Educause*, March/April 2013.

> http://www.educause.edu/ero/article/bigfoot-goldilocks-and-moonshots-report-frontiers-personalized-learning

> This report suggests "The detailed results are still emerging, but the initial results suggest we may be able to deliver high-quality education at an affordable price without sacrificing access."

McBrady, S., & Williamson, R. (2010). *Proven Strategies for Personalizing America's High Schools*. Fairfield, CT: Education Partnerships.

> http://files.eric.ed.gov/fulltext/ED538408.pdf

> Some students are not successful in the traditional high school environment and need extra support. Many high schools have responded to this need by implementing a variety of interventions for these students. This article discusses those interventions and two that have a proven connection to improved graduation rates: looping and transition programs to adult life.

Miller, L., Gross, B., & Lake, R. (2014). *Is Personalized Learning Meeting Its Productivity Promise? Early Lessons from Pioneering Schools*. Seattle, WA: Center on Reinventing Public Education.

> http://www.crpe.org/sites/default/files/CRPE_personalized-learning-productivity-promise201405.pdf

> This article presents early findings from the Center on Reinventing Public Education's two-year study analyzing the financial plans of 20 schools that received grants from the Next Generation Learning Challenges (NGLC) initiative, a multi-year collaborative effort between the Bill & Melinda Gates Foundation, the William and Flora Hewlett Foundation, educators, innovators, and technology leaders, that seeks to dramatically improve college readiness through digitally enhanced personalized learning.

Nebbergall, A. (2012). *Integration of Technology in Teaching and Learning: Comprehensive Initiatives Enhance Student Engagement and Learning*. Fairfax, VA: ICF International.

> http://files.eric.ed.gov/fulltext/ED532587.pdf

> This information brief reviews the leading research and outlines specific strategies implemented at the state level to ensure that technologies meaningfully support the education of all students.

Pearson Education. *Personalized Learning: The Nexus of 21st Century Learning and Educational Technologies*. Upper Saddle River, NJ: Author.

> http://www.pearsoned.com/wp-content/uploads/pearson_personalizedlearning.pdf

> This issue paper examines the underlying research for personalized learning and defines effective solutions.

Quint, J. (2006). *Meeting Five Critical Challenges of High School Reform*. New York, NY: MDRC.

http://www.mdrc.org/sites/default/files/full_440.pdf

This report for policymakers, practitioners, and other decision makers summarizes and synthesizes what has been learned from evaluation findings, concluding that low-performing schools face five challenges, the first being "creating a personalized and orderly learning environment."

Redding, S. (2013). Getting Personal: The Promise of Personalized Learning. In M. Murphy, S. Redding, & J. Twyman (Eds.), *Handbook on Innovations in Learning* (pp. 113-130). Philadelphia, PA: Center on Innovations in Learning, Temple University; Charlotte, NC: Information Age Publishing.

http://www.centeril.org/handbook/Getting_Personal_SA.pdf

The author provides an historical overview of the concept of personalized learning, framing it as an inroad to the acquisition of 21st-century skills, and demonstrates how his theory would be realized in different contexts.

Stanford Center for Opportunity Policy in Education. (2014). *New Research Shows Effectiveness of Student-centered Learning Approaches in Closing the Opportunity Gap*. Stanford, CA: Author.

https://edpolicy.stanford.edu/news/articles/1217

According to this article, "A cross-case analysis, a technical report, an educators' tool, and a research and policy brief offer evidence of the positive impact of student-centered learning."

Svenningsen, L., & Pear, J. J. (2011). Effects of Computer-Aided Personalized System of Instruction in Developing Knowledge and Critical Thinking in Blended Learning Courses. *Behavior Analyst Today*, *12*(1), 33–39.

http://files.eric.ed.gov/fulltext/EJ958869.pdf

Two experiments were conducted to assess an online version of Keller's personalized system of instruction, called computer-aided personalized system of instruction (CAPSI), as part of a blended learning design with regard to course knowledge and critical thinking development. In Experiment 1, two lecture sections of an introduction to University course received a CAPSI assignment while two received an extra paper assignment. In Experiment 2, one lecture section of an introduction to University course received a CAPSI assignment while another lecture section was assigned a research paper. In the two experiments the CAPSI sections consistently outperformed the sections with which they were compared, indicating that CAPSI is a viable option in higher education.

Tamin, R. M., Bernard, R. M., Borokhovski, E., Abrami, P. C., & Schmid, R. F. (2011). What Forty Years of Research Says About the Impact of Technology on Learning: A Second-Order Meta-Analysis and Validation Study. *Review of Educational Research*, *81*(1), 4–28.

    http://rer.sagepub.com/content/81/1/4.full.pdf+html

    This research study employs a second-order meta-analysis procedure to summarize 40 years of research activity addressing the question: Does computer technology use affect student achievement in formal face-to-face classrooms as compared to classrooms that do not use technology?

Tokuhama-Espinosa, T. (2012). What Neuroscience Says About Personalized Learning. *Educational Leadership*, *69*(5).

    http://www.ascd.org/publications/educational-leadership/feb12/vol69/num05/What-Neuroscience-Says-About-Personalized-Learning.aspx

    According to this article, "Discoveries about the brain can help teachers individualize learning. But first we must sort the truth from the hype."

U.S. Department of Education, Office of Innovation and Improvement. (2008). *Evaluating Online Learning Challenges and Strategies for Success*. Washington, DC: Author.

    http://www2.ed.gov/admins/lead/academic/evalonline/evalonline.pdf

    The evaluations highlighted in this guide represent a broad spectrum of online options, from programs that provide online courses to websites that feature educational resources. The evaluations themselves range from internal assessments to external, scientific research studies. All demonstrate how program leaders and evaluators have been able to implement strong evaluation practices despite some challenges inherent to examining learning in an online environment.

U.S. Department of Education, Office of Planning, Evaluation, and Policy Development. (2010). *Evaluation of Evidence-based Practices in Online Learning: A Meta-analysis and Review of Online Learning Studies*. Washington, DC: Author.

    https://www2.ed.gov/rschstat/eval/tech/evidence-based-practices/finalreport.pdf

    A systematic search of the research literature from 1996 through July 2008 identified more than a thousand empirical studies of online learning. Analysts screened these studies to find those that (a) contrasted an online to a face-to-face condition, (b) measured student learning outcomes, (c) used a rigorous research design, and (d) provided adequate information to calculate an effect size. This report is the resultant meta-analysis and review.

Wang, H., & Woodworth, K. (2011). *A Randomized Controlled Trial of Two Online Mathematics Curricula.* Evanston, IL: Society for Research on Educational Effectiveness.

http://files.eric.ed.gov/fulltext/ED528686.pdf

This study applies a randomized controlled trial to examine the effects of supplemental instruction using two online mathematics curricula: DreamBox and Reasoning Mind. It is an independent evaluation intended to generate unbiased results that will help inform the ongoing development of a charter school network's hybrid instructional model, which supplements traditional face-to-face instruction with instruction provided via computer-based programs.

Personalized Learning Design:

Alliance for Excellent Education. (2014). *Creating Anytime, Anywhere Learning for All Students: Key Elements of a Comprehensive Digital Infrastructure*. Washington, DC: Author.

http://all4ed.org/wp-content/uploads/2014/06/DigitalInfrastructure.pdf

While connecting the nation's schools and libraries to the Internet by modernizing and expanding the federal E-rate program currently dominates education technology efforts, this report urges that adequate broadband access be accompanied by a comprehensive "digital infrastructure" that unlocks the potential technology to enhance student learning. This report adopts a broader definition of digital infrastructure that includes professional learning, changes in pedagogy, parent and community engagement, and assessment and data systems.

Bailey, J., Schneider, C., & Vander Ark, T. (2013). *Funding Students, Options, and Achievement*. Tallahassee, FL: Digital Learning Now.

http://digitallearningnow.com/site/uploads/2014/05/Funding-Paper-Final.pdf

According to this interactive paper, today's school finance system was not created with the flexibility needed to support the wave of educational innovations spreading across the nation. Innovations such as online learning and competency-based education hold the potential to personalize and customize learning and extend equitable student access to high-quality learning options. Building on existing policy examples, the authors offer a set of design principles that will aid policymakers as they reorient the system around students. With these design principles at the core, a student-centered finance system will recognize diverse student needs, allow dollars to follow students to high-quality online and blended learning options, create mechanisms for ensuring quality, and foster educational innovation.

Blackboard. (2012). *Learning in the 21st Century: Mobile Devices + Social Media = Personalized Learning*. Washington, DC: Blackboard; Irvine, CA: Project Tomorrow.

http://www.blackboard.com/resources/markets/k-12/collateral/project-tomorrow/K12_Prjct-Tmrw_Mbl-Rpt_2012.pdf

This report found that mobile devices combined with social media and wireless connectivity are enabling more personalized learning opportunities, and parents are increasingly supportive of mobile learning, but changing teacher practice is a challenge.

Bray, B., & McClaskey, K. (2013). *A Step-by-Step Guide to Personalize Learning*. Eugene, OR: International Society for Technology in Education.

http://files.eric.ed.gov/fulltext/EJ1015153.pdf

The co-founders of Personalize Learning, LLC, offer a detailed six-step approach to creating a classroom environment that gives each learner voice and choice.

Clarke, J. (2003). *Changing Systems to Personalize Learning: Introduction to the Personalization Workshops*. Providence, RI: The Education Alliance at Brown University.

http://alliance-13.alliance.brown.edu/pubs/changing_systems/introduction/introduction.pdf

This guidebook draws from current research and classroom experience to provide background information on the systems that must change in order to create more personalized environments for teaching and learning.

Edwards, D. (2012). *Planning and Designing for K–12 Next Generation Learning*. Vienna, VA: International Association for K–12 Online Learning.

http://net.educause.edu/ir/library/pdf/NGT1303.pdf

This toolkit is designed to help the reader: understand next-generation learning and the need for change, gain a working knowledge of the planning and change management process, plan and design a framework for next-generation learning, and understand how to ensure quality and continuous improvement for their design.

Ferguson, D. L., et al. (1996). *Designing Classroom Curriculum for Personalized Learning*. Eugene, OR: University of Oregon College of Education.

http://files.eric.ed.gov/fulltext/ED405719.pdf

This teacher training module is designed to help teachers design curriculum and teaching to accommodate student diversity. The approach locates decisions with groups of teachers, creates new roles for both general and special educators, and redesigns the Individualized Education Program. After an introduction and overview, the first section presents an overall framework for thinking about curriculum design that will apply to any student's learning style, learning preference, and personal interests.

Glowa, L. (2013). *Re-Engineering Information Technology Design Considerations for Competency Education*. Vienna, VA: International Association for K–12 Online Learning.

http://www.competencyworks.org/wp-content/uploads/2013/02/iNACOL_CW_IssueBrief_ReEngineeringCompEd_final.pdf

This paper analyzes and examines components and elements of effective competency-based information systems. Based on interviews and research, the ideas it presents build upon the lessons learned in analyzing information systems developed by competency education innovators, best practices of systemic approaches to information management, and emerging opportunities. The paper is designed for readers to find those issues that are of most interest to them in their role and be used to catalyze strategies, support new competency-based instructional models, and inform decision making for continuous improvement.

Martinez, M. (2013). Key Design Considerations for Personalized Learning on the Web. *Educational Technology & Society*, 4(1), 26–40.

> http://www.ifets.info/journals/4_1/martinez.html

> This article describes a study that examines how individuals learn in adaptive Web learning environments. Included are guidelines that have evolved from the study's results for designing interactive learning environments from an alternative perspective. Offering a whole-perspective perspective about learning, this paper introduces (a) profiles that describe fundamental differences in how people learn, (b) specific reasons why some learners may be more successful than others, (c) strategies for helping learners improve Web learning ability, and (d) design guidelines that tap into the dominant influence of emotions, intentions, and social factors on learning.

Miller, L. J., Gross, B., & Ouijdani, M. (2012). *Getting Down to Dollars and Cents: What Do School Districts Spend to Deliver Student-Centered Learning?* Seattle, WA: Center on Reinventing Public Education.

> http://www.crpe.org/sites/default/files/pub_scl_dollarsandcents_nov12.pdf

> This report describes funding issues related to student-centered learning approaches: authentic instruction, mastery-based assessment, and real-life learning experiences outside the school walls or school day. The reader can use this report to guide discussion and decision making around financial implications for a particular learning environment.

Next Generation Learning Challenges. (2012). *Breakthrough Models for College Readiness: An Introduction to Next Generation Blended Schools*. Washington, DC: Author.

> http://net.educause.edu/ir/library/pdf/NG1232.pdf

> This resource provides practical details of 20 school models funded by Next Generation Learning Challenges (NGLC) and is focused on their various academic and financial approaches and the technology tools used. These brief profiles can be used as case studies to better understand different design options for next generation learning.

Public Impact. (2012). *Tailoring Models to Fit Your School*. Chapel Hill, NC: Author.

> http://opportunityculture.org/tailoring-models/

> This Public Impact webpage can help planning team members adapt staffing models to better match their school and their students and teachers. It identifies key factors to consider such as values-alignment, constraints, and what defines an "excellent teacher." It begins asking "what are your goals?" stating, "Personalizing student learning, developing the whole child, and increasing higher-order learning are some possibilities."

Shubilla, L., & Sturgis, C. (2012). *The Learning Edge: Supporting Student Success in a Competency-Based Learning Environment*. Vienna, VA: International Association for K–12 Online Learning.

> http://www.competencyworks.org/wp-content/uploads/2012/12/iNACOL_CW_IssueBrief_LearningEdge_full.pdf

> This paper delves into the subject of students receiving timely, differentiated support based on their individual learning needs. Understanding how to structure supports is important because learning in a competency-based environment means that students and adults are often on the edge of their comfort zone and competence — the learning edge. In this paper the reader will learn how innovators are designing school culture, embedding supports, and organizing resources to ensure students are progressing and on pace.

Sturgis, C. (2012). *The Art and Science of Designing Competencies*. Vienna, VA: International Association for K–12 Online Learning.

> http://www.nmefoundation.org/getmedia/64ec132d-7d12-482d-938f-ce9c4b26a93b/CompetencyWors-IssueBrief-DesignCompetencies-Aug-2012

> This issue brief brings together insights from a number of leading practitioners from around the country. Listen to the voices of innovators as they share their insights and lessons learned on how to build powerful competencies, engage teachers, and integrate lifelong learning competencies.

U.S. Department of Education. (2010). *Learning: Engage and Empower*. Washington, DC: Author.

> http://tech.ed.gov/netp/learning-engage-and-empower/

> According to this article, personalized learning "combines paced and tailored learning with flexibility in content or theme to fit the interests and prior experience of each learner."

U.S. Department of Education Office of Educational Technology. (2012). *Enhancing Teaching and Learning through Educational Data Mining and Learning Analytics: An Issue Brief*. Washington, DC: Author.

> http://www.ed.gov/edblogs/technology/files/2012/03/edm-la-brief.pdf

> This issue brief was inspired by the vision of personalized learning and embedded assessment in USDOE's 2010 National Education Technology Plan (NETP). As described in the plan, increased use of online learning offers opportunities to integrate assessment and learning so that information needed to improve future instruction can be gathered in nearly real time. The first section after the Introduction is entitled Personalized Learning Scenarios.

Personalized Learning Implementation:

Bailey, J. et al. (2013). *Blended Learning Implementation Guide: Version 2.0*. Tallahassee, FL: Digital Learning Now.

>   http://digitallearningnow.com/site/uploads/2014/05/BLIG-2.0-Final-Paper.pdf

>   This interactive implementation guide is designed to help leaders create the conditions for success in planning, implementing, and evaluating their blended learning efforts.

Bailey, J., Carter, S. C., Schneider, C., Vander Ark, T., & Waldron, R. (2012). *Data Backpacks: Portable Records & Learner Profiles*. Tallahassee, FL: Digital Learning Now.

>   http://digitallearningnow.com/site/uploads/2014/05/DLN-Smart-Series-Databack-Final1.pdf

>   According to this interactive paper, "The current official transcript does not provide enough information for teachers to personalize learning from the first day of school....This paper provides two recommendations for addressing the inadequacies of today's student records in order to power personalization from day one, at every step, for every student."

Bailey, J., Schneider, C., & Vander Ark, T. (2013). *Navigating the Digital Shift: Implementation Strategies for Blended and Online Learning*. Tallahassee, FL: Digital Learning Now.

>   http://digitallearningnow.com/site/uploads/2013/10/DLN-ebook-PDF.pdf

>   The interactive paper is divided into two parts: an updated version of the *Blended Learning Implementation Guide*; and a collection of policy papers that offer advice on the policy implications generated by the shift to personalized, online, and blended learning.

Childress, S. (2013). *Shared Attributes of Schools Implementing Personalized Learning*. Seattle, WA: Bill & Melinda Gates Foundation.

>   http://nextgenstacey.com/2013/12/19/shared-attributes-of-schools-implementing-personalized-learning/

>   According to this article, "One effort underway with a number of educators and thought partners is identifying some attributes shared by personalized learning (PL) schools. It's still very much a work in progress and will serve as a complement to the helpful blended learning taxonomy developed by the Christensen Institute. By making sense of what the pioneers in the PL school space are doing, we hope to make it easier for the next wave of school design teams to get started." It then presents "the four shared attributes we're seeing so far, with brief descriptions."

Chuong, C., & Mead, S. (2012). *A Policy Playbook for Personalized Learning: Ideas for State and Local Policymakers*. Sudbury, MA: Bellwether Education Partners.

http://bellwethereducation.org/sites/default/files/PolicyPlays_Final.pdf

According to this report, across the country, a handful of models are emerging that meaningfully shift the structure and organization of schooling in order to reimagine the classroom itself, leveraging technology to change teachers' roles and create a much more personalized learning experience for students. "Yet these types of personalized learning models are still relatively rare, and are unlikely to achieve greater scale in the absence of policy changes to support their growth. The report champions the elimination of barriers to implementation of personalized learning models.

Darrow, R., Friend, B., & Powell, A. (2013). *A Roadmap for Implementation of Blended Learning at the School Level: A Case Study of the iLearnNYC Lab Schools*. Vienna, VA: International Association for K–12 Online Learning.

http://www.inacol.org/wp-content/uploads/2014/01/iNACOL_iLearnNYC_Case_Study_October2013.pdf

The New York City Department of Education established the "Innovation Zone" (iZone) in 2009, a large community of innovative NYC schools committed to personalizing learning to meet the needs, motivations, and strengths of individual students. Among other goals, this roadmap is designed to identify the essential questions for school administrators to consider prior to implementing blended learning.

Evans, M. (2012). *A Guide to Personalizing Learning—Suggestions for the Race to the Top–District Competition*. San Mateo, CA: Innosight Institute.

http://files.eric.ed.gov/fulltext/ED535179.pdf

According to this report, using online learning in blended-learning environments will be critical for most Local Education Agencies (LEAs) to realize Absolute Priority 1 of the USDOE's Race to the Top–District (RTT-D) grant program: Personalized Learning Environment(s). It states online learning holds the key to the transformation to personalized learning environments; because online learning is inherently modular, it can more easily customize for different student learning needs than can the traditional classroom, and it can create near real-time feedback loops to bolster the interactions with both the teacher and the content itself. This report attempts to answer the question that all LEAs must ask themselves in crafting their RTT-D application: What does personalized learning look like in practice?

Jacob, J. (2013). *A Personalized Future for Education: Moving into the 21st Century and Beyond*. Sacramento, CA: StudentsFirst.

http://edref.3cdn.net/4f69cbefb88e1c84bb_5d5m6y21d.pdf

This booklet has sections on What Does Personalized Learning Look Like?, Popular Models of Personalized Learning, and Implementation Challenges.

New Jersey Department of Education. (2014). *A Guide for Implementing Personalized Student Learning Plan (PSLP) Programs*. Trenton, NJ: Author.

http://www.state.nj.us/education/cte/pslp/PSLPGuide.pdf

This 248-page guide for implementing Personalized Student Learning Plan (PSLP) programs includes sections on Getting Started, Selecting and Using a Web-based Guidance System, Structuring PSLP Sessions, Developing a PSLP Curriculum, Identifying Roles for Adult Stakeholders, Training School Staff, Scheduling Decisions, Motivating Students and Staff to Embrace PSLP Programs, and Ongoing Assessment of PSLP Processes.

Priest, N., Rudenstine, A., & Weisstein, E. (2012). *Making Mastery Work: A Close-Up View of Competency Education*. Quincy, MA: Nellie Mae Education Foundation.

http://www.competencyworks.org/wp-content/uploads/2012/11/Making-Mastery-Work-NMEF-2012-Inline.pdf

This report examines the work of 10 schools participating in the Proficiency-Based Pathways Project. The report can be used to examine what mastery-based approaches to teaching and learning look like when implemented.

West Virginia Board of Education. (2012). *Personalized Learning: Guidance for West Virginia Schools and Districts*. Charleston, WV: Author.

http://wvde.state.wv.us/spl/Documents/spl_guidance_document.pdf

The third section of this document outlines a process for implementing West Virginia's Support for Personalized Learning (SPL) framework and shows how it becomes vital in a school setting.

Wicks, M. (2010). *A National Primer on K-12 Online Learning: Version 2*. Vienna, VA: International Association for K–12 Online Learning.

http://www.inacol.org/wp-content/uploads/2012/11/iNCL_NationalPrimerv22010-web1.pdf

This report states that online learning has numerous benefits, including offering customized and personalized learning. It is intended as a tool for educators and policymakers who must understand the essential elements of online learning in order to make informed decisions about implementing online and blended/hybrid programs.

Personalized Learning Evaluation:

Clarke, J. (2003). *Changing Systems to Personalize Learning: Personalized Learning*. Providence, RI: The Education Alliance/LAB at Brown University.

>   http://www.brown.edu/academics/education-alliance/sites/brown.edu.academics.education-alliance/files/publications/Personalized_Learning.pdf

>   This volume was a companion piece to the Education Alliance at Brown University workshop on Personalized Learning, designed to help teachers and school leaders develop and assess personalization programs in their own schools. It includes segments on Getting Started and on five Key Dimensions: Purpose, Organization, Content and Process, Assessment, and Leadership.

Davis, M. R. (2011). Researchers Evaluate Tech.-Oriented, Personalized Learning: But Determining What Works Is Proving To Be Challenging. *Education Week*, *30*(25), 38.

>   http://www.edweek.org/ew/articles/2011/03/17/25research.h30.html

>   This article says, "[T]he question most educators ask is: Does this tech-driven personalized approach work? That's where things get a little murky....Some studies, however, are providing clues about what works."

Herrington, A, Herrington, J., Oliver, R., Stoney, S., & Willis, J. (2001). Quality Guidelines for Online Courses: The Development of an Instrument to Audit Online Units. In G. Kennedy, M. Keppell, C. McNaught, & T. Petrovic (Eds.), *Meeting at the Crossroads: Proceedings of ASCILITE 2001*, (pp. 263–270). Melbourne: The University of Melbourne.

>   http://researchrepository.murdoch.edu.au/7053/1/quality_guidelines.pdf

>   This paper sets out to describe a workable set of guidelines for academic and support staff in the development and benchmarking of online course quality.

Johnson, J., Kendziora, K., & Osher, D. (2012). *RTT–D Guidance: Implementing Performance Metrics for Continuous Improvement that Support the Foundational Conditions for Personalized Learning*. Washington, DC: American Institutes for Research.

>   http://files.eric.ed.gov/fulltext/ED537580.pdf

>   In this report, the authors describe a continuous improvement strategy and a rigorous application of performance measures at the district, school, classroom, and student levels.

Kurilovas, E. (2009). *Methods of Multiple Criteria Evaluation of the Quality of Learning Management Systems for Personalised Learners Needs*. Vilnius, Lithuania: Institute of Mathematics and Informatics.

>   http://wwwis.win.tue.nl/lms-ale-09/Kurilovas_paper.pdf

>   The main research object of this paper is investigation and proposal of a quality evaluation method suitable for the multiple criteria evaluation (decision making) and optimization of learning software packages – Learning Management Systems (LMSs).

Project Tomorrow. (2011). *The New 3 E's of Education: Enabled Engaged Empowered – How Today's Educators are Advancing a New Vision for Teaching and Learning*. Irvine, CA: Author.

http://www.tomorrow.org/speakup/pdfs/SU10_3EofEducation_Educators.pdf

This report states that "a quarter of principals and 28 percent of district administrators note that evaluating the plethora of emerging technologies is a significant challenge for their district right now....Besides the disconnect between the administrators' vision for digital content usage and the teachers' classroom reality, another difference of opinion exists around how to most effectively evaluate the quality of digital resources for instructional use." A figure then shows how principals and teachers answer the question: What factors are most important when evaluating the quality of digital content for classroom use?

Singer, N. (2013). *Deciding Who Sees Students' Data*. New York Times Online, October 5, 2013.

http://www.nytimes.com/2013/10/06/business/deciding-who-sees-students-data.html?pagewanted=all&_r=0

In this article, Khaliah Barnes says, "Students are currently subject to more forms of tracking and monitoring than ever before. While we understand the value of data for promoting and evaluating personalized learning, there are too few safeguards for the amount of data collected and transmitted from schools to private companies."

Personalized Learning for the Student:

Bailey, J., Schneider, C., Sturgis, C., & Vander Ark, T. (2013). *The Shift from Cohorts to Competency*. Tallahassee, FL: Digital Learning Now.

http://digitallearningnow.com/site/uploads/2014/05/CB-Paper-Final.pdf

This interactive paper explores how competency education has the potential to connect learning to students' passions and interests, drawing them toward higher-order thinking and, therefore, deeper learning. And while technology is not a necessary component of competency education per se, advances in educational technology have made it possible to bring competency education to scale through an ever-expanding set of tools that can personalize and customize learning.

Brigs, H. (2014). *4 Key Considerations for Student Tablets*. Edudemic.

http://www.edudemic.com/student-tablets/

This article claims student tablets are a good investment for students "because aside from being a multimedia device, these tablet PCs have become a tool for them to make their homework, take down notes and even record their teacher's lectures."

Calkins, A., & Vogt, K. (2013). *Next Generation Learning: The Pathway to Possibility*. Washington, DC: Next Generation Learning Challenges.

http://net.educause.edu/ir/library/pdf/NGW1301.pdf

This white paper provides an in-depth overview of what next-generation learning requires based on the 10 attributes from a student's point of view. The framework lays out the six dimensions of next-generation learning and illustrates how the impact and efficacy of each dimension work together to ensure more effective design/redesign.

Davidson, P. (2014). *The Must-Have Tools for Online Learners*. Edudemic.

http://www.edudemic.com/tools-for-online-learners/

According to this article, "Having the right tools is very important to successful online classes. Teachers need the right programs to allow them to effectively teach, while students must have everything they need to engage with other students and view all the materials. The tools listed are just a few of the must-haves to make an online course a success."

Dunn, J. (2014). *This Is How Students Are Using Smartphones*. Edudemic.

http://www.edudemic.com/students-using-smartphones/

According to this article, "students are using smartphones in many interesting ways that might surprise you. Long story short, students are using their phones for taking tests, studying a bit more effectively, and talking to one another. In fact, more students say they use their phone to study rather than talk to friends."

Center on
Innovations
in Learning
http://www.centeril.org/

James, C. (2014). *5 Social Networks for Students to Get Academic Help*. Edudemic.

   http://www.edudemic.com/social-networks-for-students/

   This article holds that the "advancement in social networking platforms is providing students with much better options to engage with their contemporaries, enhance their skills and access a wide variety of academic tools and resources which will most definitely add up to their convenience."

Light, S. (2013). *5 Ways to Participate In Online Courses*. Edudemic.

   http://www.edudemic.com/participate-in-online-courses/

   This article says, "According to the National Survey of Student Engagement, research has shown that a student's success is directly related to his participation, or involvement, in the educational experience. This is particularly true in the online courses where face-to-face connections are extremely rare. Understanding the ways in which participation occurs is important for online students, instructors and administrators."

Project Tomorrow. (2011). *The New 3 E's of Education: Enabled Engaged Empowered – How Today's Students are Leveraging Emerging Technologies for Learning*. Irvine, CA: Author.

   http://tomorrow.org/speakup/pdfs/SU10_3EofEducation(Students).pdf

   This report focuses on three specific key trends that have generated significant interest in recent years, in policy discussions and within schools and districts: mobile learning, online and blended learning, and e-textbooks. It says, "[P]arents want their local schools to leverage technology to create personalized learning experiences for their child in the same way that Netflix has personalized their home movie watching experiences."

Project Tomorrow. (2012). *Mapping a Personalized Learning Journey—K–12 Students and Parents Connect the Dots with Digital Learning*. Irvine, CA: Author.

   http://files.eric.ed.gov/fulltext/ED536067.pdf

   This report focuses on how today's students are personalizing their own learning, and how their parents are supporting this effort. The key questions being addressed in this report include: How are students personalizing their learning? How are parents helping students to personalize their learning journey? What are the digitally-rich, untethered, and socially based learning strategies that facilitate this process? How can education stakeholders support students as they seek to personalize their learning? What are the gaps between administrators' views of personalized learning compared to parents' and students' views?

Personalized Learning in the Classroom:

Bailey, J., Hassel, B., Hassel, E. A., Schneider, C., & Vander Ark, T. (2013). *Improving Conditions & Careers: How Blended Learning Can Improve the Teaching Profession*. Tallahassee, FL: Digital Learning Now.

> http://digitallearningnow.com/site/uploads/2014/05/Conditions-and-Careers-Final-Paper1.pdf

> This paper presents a vision of blended learning that offers better teaching conditions, while advocating for thoughtful policies that will allow teachers to create personalized learning experiences.

Bailey, J., Patrick, S., Schneider, C., & Vander Ark, T. (2013). *Online Learning: Myths, Reality & Promise*. Tallahassee, FL: Digital Learning Now.

> http://digitallearningnow.com/site/uploads/2014/05/Online-Learning-Paper-.pdf

> This interactive paper challenges current myths and replaces them with realities that will advance the field of online learning. Student success stories and teacher profiles are woven throughout to show "the faces of online learning."

Baker, M. (2013). *The Personal Touch: Classroom Innovation for Personalized Learning*. New York, NY: NY Metro Parents Magazine.

> http://www.nymetroparents.com/article/innovative-educators-bring-customized-approach-to-teaching#.U_TuSErD9zM

> According to this article, "One size does not fit all when it comes to learning, and a variety of innovative educators are honing in on that idea to bring a more customized approach to teaching our children."

Chan, R. W. (2014). *Personalized Learning 101: Designing Your Classroom*. Wilmington, DE: Rodel Foundation of Delaware.

> http://www.rodelfoundationde.org/personalized-learning-101-designing-your-classroom/

> This article describes a "Design Your Classroom" exercise, stating, "The options for what the redesigned classroom can look like are endless, and the exercise can build an understanding of how the 'traditional' classroom might be reimagined in order to enable personalized learning for all students."

Davis, T. (2013). *A Teacher's Take on Personalized Learning*. Sacramento, CA: StudentsFirst.

> http://www.studentsfirst.org/blog/entry/a-teachers-take-on-personalized-learning

> The teacher writing this article states, "I often use the rotation model with my students, as my classroom lacks the technology for virtual learning. I have found that rotation learning breaks up the monotony of a lecture-style classroom for students and gives me as the teacher an opportunity to meet students on their level using a differentiated learning environment."

http://www.centeril.org/

Horn, M. B., & Evans, M. (2013). *Classroom Opportunity: Creating a Personalized Learning Experience*. Alpharetta, GA: AdvancED.

http://www.advanc-ed.org/perspectives/classroom-opportunity-creating-personalized-learning-experience

This article says that, while school leaders and system officials may provide the necessary infrastructure, hardware, and technology for personalized learning, the larger task is familiarizing leaders, teachers, and staff with the idea that students can and should take ownership of their learning by demonstrating mastery before moving on.

Kelly, J. (2013). *What Personalized Learning Really Means For Modern Teachers*. Edudemic.

http://www.edudemic.com/personalized-learning-for-teachers/

According to this article, "Many people think that Personalized Learning is all about technology. It is not, although technology makes it more accessible in over-crowded classrooms. If an individual student has Internet access, that student can work independently while the teacher facilitates an in-depth discussion with a small group at another skill level. Technology empowers the teacher to keep a larger number of students at different levels moving forward simultaneously."

O'Ferrall, M. E. B., Henschell, S., & Roth M. (2014). *PersonalizED: A Guide to Personalizing Learning in the Classroom*. Baltimore, MD: An Estuary.

http://anestuary.com/blog/2014/6/30/personalized

This paper outlines a philosophy and method for designing personalized learning in the classroom that, when realized, will result in the creation of a personalized learning ecosystem.

Osofsky, D., Sinner, G., & Wolk, D. (2003). *Changing Systems to Personalize Learning: The Power of Advisories*. Providence, RI: The Education Alliance at Brown University.

http://alliance-13.alliance.brown.edu/pubs/changing_systems/power_of_advisories/index.php

The Power of Advisories guidebook helps high school change teams conduct workshops for school staff on setting up a schoolwide advisory program, developing ways to introduce an adult advocate into the life of every student, and ensuring that each student has an advisor to help guide student planning, learning, and assessment.

Project Tomorrow. (2012). *Personalizing the Classroom Experience – Teachers, Librarians and Administrators Connect the Dots with Digital Learning*. Irvine, CA: Author.

http://files.eric.ed.gov/fulltext/ED536069.pdf

The Speak Up National Research Project has endeavored to stimulate new discussions around how technology tools and services can transform education and to provide a context to help education, parent, policy, and business leaders think beyond today and envision tomorrow. With the 2012 report on the data findings from the educators' responses, the researchers provided new insights into how to personalize the classroom experience by first examining how today's teachers, librarians, and administrators are using technology themselves for professional tasks, and then how those experiences are driving new plans and policies for technology use in our schools. The big question remains: How do we connect the dots with digital learning to more effectively leverage technology to fulfill the promise of personalized learning? The goal for schools and districts is simple. The effort requires a new level of commitment to achieve success.

Redding, S. (2013). *Through the Student's Eyes: A Perspective on Personalized Learning*. Philadelphia, PA: Center on Innovations in Learning, Temple University; Charlotte, NC: Information Age Publishing.

http://www.centeril.org/publications/2013_09_Through_the_Eyes.pdf

This paper expands upon the standard definition of personalized learning to assert a multidimensional role for the teacher and vivify the place of motivation, metacognition, and social and emotional competency in personalized learning.

Redding, S. (2014). *Personal Competencies in Personalized Learning*. Philadelphia, PA: Center on Innovations in Learning, Temple University.

http://www.centeril.org/publications/Personalized_Learning.pdf

In this report, Dr. Redding discusses four different kinds of personal competencies that students employ in achieving mastery (cognitive competency, metacognitive competency, motivational competency, and social/emotional competency) and examines ways they can be strengthened through school community, school culture, and the classroom. In addition, this report features a Personal Competency Framework that illustrates the four personal competencies and the behavior patterns that develop from them in student learning. It also provides example templates that can be used as an exercise to begin enhancing personal competencies.

Redding, S. (2014). *Personal Competency: A Framework for Building Students' Capacity to Learn*. Philadelphia, PA: Center on Innovations in Learning, Temple University.

http://www.centeril.org/publications/Personal_Compentency_Framework.pdf

In this report, Dr. Redding discusses the elements of a Personal Competency Framework, including personal competencies (cognitive competency, metacognitive competency, motivational competency, and social/emotional competency), learning habits, mastery, competency enhancement, competency reinforcement, and contexts. And he also discusses putting the pieces together.

Redding, S. (2014). *The Something Other: Personal Competencies for Learning and Life*. Philadelphia, PA: Center on Innovations in Learning, Temple University.

http://www.centeril.org/publications/The_Something_Other.pdf

In this report, Dr. Redding states, "Teachers know that each student brings to a learning task a *something other*—certain attributes that affect how the student responds to the challenge. In this paper, the something other is the constellation of personal competencies—cognitive, metacognitive, motivational, and social/emotional—and the learning habits that flow from them."

Riddell, R. (2014). *Edgenuity CEO Talks Personalized Learning and Classroom Tech [ISTE]*. Washington, DC: Education Dive.

http://www.educationdive.com/news/edgenuity-ceo-talks-personalized-learning-and-classroom-tech-iste/283165/

Even with today's increasingly technological classroom, kids often have to fail before they're offered an opportunity to learn with the tools best suited to them at a pace they're comfortable with. But in this interview, Edgenuity CEO Sari Factor says this shouldn't be the case.

Schwartzbeck, T. D., & Wolf, M. A. (2012). *The Digital Learning Imperative: How Technology and Teaching Meet Today's Education Challenges*. Washington, DC: Alliance for Excellent Education.

http://all4ed.org/wp-content/uploads/2012/01/DigitalLearningImperative.pdf

This brief includes new definitions and data, specific benefits of digital learning with examples from schools and districts that are seeing significant improvements in student outcomes; a broader look at technology and digital learning beyond online courses and content; and important connections among instruction, learning, and technology, with a specific emphasis on instructional strategies.

Sizer, T. R. (1999). No Two Are Quite Alike. *Educational Leadership*, *57*(1), 6–11.

http://www.ascd.org/publications/educational-leadership/sept99/vol57/num01/No-Two-Are-Quite-Alike.aspx

According to this article, teachers cannot teach students well if they do not know them well so, at its heart, personalized learning requires profound shifts in their thinking about education and schooling.

Turner, B. (2013). *Personalized Learning: Using Technology as a Tool*. Nashville, TN: Classroom Chronicles, Tennessee Department of Education.

http://tnclassroomchronicles.org/personalized-learning-using-technology-tool/

Personalized learning looks different in every classroom, but at the core, it allows students to move at a pace comfortable for them within a regular classroom. The department's director of personalized learning, Brett Turner, talks about what personalized learning can look like in the classroom and how more teachers can use technology as a tool for instruction.

Wolf, M. A. (2012). *Culture Shift: Teaching in a Learner-Centered Environment Powered by Digital Learning*. Washington, DC: Alliance for Excellent Education.

http://all4ed.org/wp-content/uploads/2013/10/CultureShift.pdf

This paper states that, to meet the needs of the diverse student population, the education system must provide a more personalized, rigorous, and collaborative learning environment that move from teacher-directed, one-size-fits-all instructional strategies toward a learner-centered model. The paper delves deeply into the characteristics of a learner-centered approach to education and the support that educators and schools require.

Personalized Learning in the School:

Afterschool Alliance. (2011). *Student-Centered Learning in Afterschool: Putting Students' Needs and Interests First*. Washington, DC: Author.

> http://files.eric.ed.gov/fulltext/ED539822.pdf

> According to this issue brief, increasingly, high quality afterschool programs focused on the whole child are helping youth gain access to more resources and providing an unparalleled space for them to have a hand in their own learning in ways that suit their most pressing needs and keenest interests. Innovative afterschool programs with a student-centered approach have the potential to prepare youth as responsible citizens who are in control of their future.

Amoss, M. (2013). *Personalized Learning – Coming to a Classroom Near You*. Baltimore, MD: Johns Hopkins Magazine.

> http://hub.jhu.edu/magazine/2013/fall/personalized-learning-data-tracking#

> According to this report, "To pull off personalized learning, schools need to switch from a focus on summative data (grades on midterm exams, papers, or tests; scores gathered at the end of a project or semester, etc.) to more-frequently gathered formative data (more-timely measures of skill level, mastery of concepts, etc.)—and then put that data to more strategic use."

Bailey, J., Schneider, C., & Vander Ark, T. (2012). *Getting Ready for Online Assessments*. Tallahassee, FL: Digital Learning Now.

> http://digitallearningnow.com/site/uploads/2014/05/Getting-Ready-for-Online-Asst.-Updated-Jan-2013.pdf

> This interactive report begins by framing the shift to online assessments within the larger framework of the transition to personalized learning.

Center for Digital Education. (2014). *The Path to Modern Education: Preparing Your Network for Personalized Learning*. Folsom, CA: Author.

> http://825d0007e19cfb8330f5-793aa0e2839afbbc4a0b9a46376ed589.r13.cf1.rackcdn.com/CDE14_WHITE_PAPER_Aerohive_V.pdf

> This white paper discusses the steps school leaders can take to ensure their personalized learning initiatives are supported by a robust network infrastructure.

Corry, M., & Carlson-Bancroft, A. (2014). Transforming and Turning Around Low-Performing Schools: The Role of Online Learning. *Journal of Educators Online*, *11*(2).

> http://files.eric.ed.gov/fulltext/EJ1033256.pdf

> This review of the literature examines online learning as a core strategy for bold, dramatic curricular reform within transformational or turnaround models in improving low-performing K–12 schools. The analysis of the literature in this area found benefits of online learning in transforming and turning around low-performing schools to include providing highly individualized and differentiated environments allowing for personalized learning.

The Education Alliance at Brown University. *Changing Systems to Personalize Learning* (website). Providence, RI: Author.

> http://alliance-13.alliance.brown.edu/pubs/changing_systems/

> This website offers a series of guidebooks that supports secondary school change teams in conducting professional development workshops to better understand personalized learning.

Evans, J., Green, N., & Hudson, T. (2013). *The Future of Personalized Learning in Elementary Schools*. Irvine, CA: Project Tomorrow.

> http://www.edweek.org/media/06-20-13-personalized-learning.pdf

> This presentation discusses how elementary students are personalizing learning already, both in and out of school; parents' aspirations; how well today's elementary schools are meeting the student and parent aspirations; and the teacher and principal point of view on personalized learning with new tech tools.

Hamilton, L., & Mackinnon, A. (2013). *Opportunity by Design: New High School Models for Student Success*. Tallahassee, FL: Digital Learning Now.

> http://carnegie.org/fileadmin/Media/Programs/Opportunity_by_design/Opportunity_By_Design_FINAL.pdf

> According to this paper, "School redesign is an ambitious response to the…Common Core, but nothing less will capitalize fully on this extraordinary opportunity and produce the realignment of resources needed to provide all high school students, including those who are underprepared, with powerful, personalized learning."

Rubenstein, G. (2010). *Ten Tips for Personalized Learning via Technology*. San Rafael, CA: Edutopia.

> http://www.edutopia.org/stw-differentiated-instruction-ten-key-lessons

> According to this article, "To challenge and support each child at his or her own level, the educators of Forest Lake Elementary deploy a powerful array of digital-technology tools. Discover what your school can learn."

Savitz, E. (2012). *5 School Technologies To Watch: Personalized Learning Is Here*. New York, NY: Forbes.

> http://www.forbes.com/sites/ciocentral/2012/10/22/5-school-technologies-to-watch-personalized-learning-is-here/
>
> According to this article, "School technology decisions are becoming more democratic, and the pervasiveness of Internet-connected devices is helping to lead a revolution. We are reaching a point in time where technology is empowering people toward a path of personalization, and almost every new technology in the education technology space today fills a cog in that wheel. The following are some of the top trends and market innovators leading the charge this coming year – attracting developers and investors along the way."

Teich, A. G. (2014). *Increasing Student Achievement with Adaptive Learning Technology: Tech & Learning Survey Results*. New York, NY: Technology & Learning.

> http://resource-center.newbay-media.com/resource_center/assets/tle/NewBayPlus_Dreambox_WhitePaper_EDT_V2.pdf
>
> According to this report, "Now, emerging educational technology is proving that personalized student assessment and instruction can be successfully delivered on an ongoing basis, aligned with learning standards and desired outcomes....As Tech & Learning editors investigated this emerging technology, they felt it was an opportune moment to conduct the first K-12 survey on the use of adaptive learning technology....This paper reports on the results of the survey, documenting what was revealed about how educators are using adaptive learning software and systems, the most important benefits, the challenges to implementation, and the future promise for student achievement."

Vander Ark, T., & Schneider, C. (2013). *How Digital Learning Contributes to Deeper Learning*. Federal Way, WA: Getting Smart.

> http://gettingsmart.com/wp-content/uploads/2012/12/Digital-Learning-Deeper-Learning-Full-White-Paper.pdf
>
> This paper identifies three primary ways that digital learning promotes deeper learning: personalized skill building in preparation for deeper learning; schools and tools that foster deeper learning (e.g., project-based learning networks); and extended access to quality courses and teachers online.

Westover, J. (2012). Personalized Pathways to Success. *Leadership*, *41*(5), 12–14, 35–36.

> http://files.eric.ed.gov/fulltext/EJ971417.pdf
>
> In this article, the author discusses how schools are using data about college and career readiness of students to focus and refine their systems of support. The author points out that the outcome of college and career readiness for all students has the potential to personally touch the learning of every student, but only if schools have a truly integrated system of support. As school and districts implement integrated systems of support, the barriers to ensuring all students become college and career ready will fall away. Undertaking a gap analysis of current systems provides a deeper understanding of college and career readiness as well as a method to identify areas of focus and next action steps.

Worsley, D. (2003). *Changing Systems to Personalize Learning: Teaching to Each Student*. Providence, RI: The Education Alliance at Brown University.

http://alliance-13.alliance.brown.edu/pubs/changing_systems/teach_to_student/TeachingEachStudent.pdf

Teachers have begun to appreciate the power of personalized teaching, not only to change students' lives, but also to invigorate their own. To begin – or to reinforce – this process of change and invigoration, the *Teaching to Each Student* guidebook helps high school change teams conduct workshops that immerse school staff in the reality of personalized teaching. Through experiential activities, study, and action planning, participants learn to reorient classroom teaching to allow students with different skills, aspirations, and interests to succeed in meeting uniform standards.

Personalized Learning in the District:

Bailey, J., Owens, D., Schneider, C., Vander Ark, T., & Waldron, R. (2014). *Smart Series Guide to EdTeach Procurement*. Tallahassee, FL: Digital Learning Now.

> http://digitallearningnow.com/site/uploads/2014/05/Procurement-Paper-Final-Version.pdf
>
> The goal of this interactive paper is to create a framework for EdTech purchasing by offering practical advice to guide key decisions, sharing lessons learned from districts that have already made the digital shift, discussing the implications for blended learning, and providing examples of best practices in education policy that support smart procurement.

Bailey, J., Schneider, C., & Vander Ark, T. (2012). *Funding the Shift to Digital Learning: Three Strategies for Funding Sustainable High-Access Environments*. Tallahassee, FL: Digital Learning Now.

> http://digitallearningnow.com/site/uploads/2014/05/DLN-Smart-Series-Paper-1-Final.pdf
>
> The interactive paper asks leaders and policymakers to consider three strategies for investing in student access: state and district-provided funding, subsidized parent pay, and a mixed model, which includes bring your device (BYOD) policies. The paper highlights real examples of how states and school leaders are providing their students with the tools they'll need to access next generation learning opportunities.

Cook, R. (2014). *How a District Ended Student Dropouts with Personalized Learning*. Burlingame, CA: EdSurge.

> https://www.edsurge.com/n/2014-04-14-how-a-district-ended-student-dropouts-with-personalized-learning
>
> This article begins, "Imagine, if you can, a school where students do not have specific teachers assigned to them, nor do teachers have specific students on their roster. Imagine a school where students come each day with a list of standards to work on and accomplish--right when they walk in the door. They can go to the teacher of their choice in order to accomplish the completion of these standards. Or, they can do them on their own in any setting they wish, as long as they maintain accomplishing the minimum amount of standards in a minimum amount of time. Some students, for example, may work individually in the media center not having to go to any classroom. And last but not least, imagine a district at large where the dropout rate is at zero percent."

Duffey, D., & Fox, C. (2012). *National Educational Technology Trends 2012: State Leadership Empowers Educators, Transforms Teaching and Learning*. Washington, DC: State Educational Technology Directors Association (SETDA).

> http://files.eric.ed.gov/fulltext/ED536746.pdf
>
> This report includes multiple examples of innovative, educational technology programs – including Personalized Learning programs – in states and districts that were funded by federal, state, local, and private sources, and an analysis of the federal technology grants awarded by the U.S. Department of Education to state educational agencies through the Enhancing Education Through Technology (EETT) grant program EETT American Recovery and Reinvestment (ARRA) Act funds.

http://www.centeril.org/

Education Elements. (2013). *Hardware Analysis for School Districts*. San Carlos, CA: Author.

http://www.edelements.com/wp-content/uploads/EE.HardwareAnalysis_20130911-2.pdf

As districts develop instructional models that personalize learning and prepare students for 21st century college and career readiness, they invariably begin to consider large hardware purchases. This white paper is offered in an effort to provide a thoughtful framework as well as recent research to help inform these device decisions.

Hanover Research. (2012). *Best Practices in Personalized Learning Environments (Grades 4-9)*. Washington, DC: Author.

http://www.hanoverresearch.com/media/Best-Practices-in-Personalized-Learning-Environments.pdf

This report reviews a variety of individualized learning promising practices, including the development of sophisticated school- and district-wide data systems, the use of real-time student assessment to improve instruction, the creation of flexible learning options for students, competency- and performance-based curricular frameworks, and online and blended learning approaches.

McNeil, M. (2013). 'Personalized Learning' Varies for Race to Top Districts. *Education Week*, *32*(26), 1, 16–17.

http://www.edweek.org/ew/articles/2013/03/27/26rtt.h32.html

This article begins, "The 16 Race to the Top district winners, pushed by $400 million in federal grants that put a premium on personalized learning, are embarking on vastly different makeovers of the classroom experience—from districtwide approaches to a narrower blueprint focused on middle school math. Despite the divergent approaches, a review of the winning applications shows those districts are tapping similar tactics: mobile devices and individualized learning plans for students, personalized learning coaches for teachers, and data dashboards that collect all student learning information in one place."

Ryerse, M., Schneider, C., & Vander Ark, T. (2014). *Core & More: Guiding and Personalizing College and Career Readiness*. Tallahassee, FL: Digital Learning Now.

http://digitallearningnow.com/site/uploads/2014/05/FINAL-Smart-Series-Core-and-More-Guidance.pdf

This interactive paper states blended and online learning offer the complementary potential of stronger engagement, customized pathways, and equalized opportunities. The intent of this paper is to clarify the central mission of student guidance systems, sketch the architecture of information systems, and explain why now is the time to investigate the role of technology in creating a next-generation system of student guidance and support.

Center on Innovations in Learning   http://www.centeril.org/

Sturgis, C. (2014). *Progress and Proficiency: Redesigning Grading for Competency Education*. Vienna, VA: International Association for K–12 Online Learning.

http://www.competencyworks.org/wp-content/uploads/2014/01/CW-Progress-and-Proficiency-January-2014.pdf

This report was written to help education leaders think through how to design grading policies that communicate academic performance to students and parents. As more schools and districts begin to develop competency-based pathways that allow students to progress based on demonstrated mastery of content knowledge and skills rather than just time spent in a classroom, it is imperative that they rethink their grading systems around competency.

Turnaround for Children. (2012). *Race to the Top–District Action Brief: Establishing the Foundational Conditions for Personalized Learning*. New York, NY: Author.

http://turnaroundusa.org/wp-content/uploads/2012/10/RTTD-Action-Brief-Establishing-the-Foundational-Conditions-for-Personalized-Learning.pdf

This white paper contains powerful language and actionable items that districts can and should use to address RTT–D's Absolute Priority 1 and Competitive Preference Priority.