Introduction

Personalized learning structures empower teachers and students to take charge of their education experiences. In student-centered classrooms, students learn at their own pace, in a way that matches their own needs and interests.

This toolkit will show you how to support personalized learning in its many forms using digital tools and curriculum in order to maximize student engagement and achievement.

What is Personalized Learning?
See how personalized learning, tailored to each student’s strengths, needs, and interests, maximizes student engagement and achievement.

Adaptive Learning
Explore ways of utilizing adaptive learning software to personalize instruction in a classroom.

Digital Curriculum
Understand how learning can be personalized when students have access to digital resources.

OER (Open Education Resources)
Learn how customizable educational resources can help teachers adapt learning for a variety of contexts.

Resources
Access resources to learn more and adopt personalized learning practices in your classroom.
What Is Personalized Learning?

**Personalized Learning 101**
Characteristics
Fact & Fiction
7 Things to Know
1:1 Environment
Technology Integration

**In the Classroom**
Traditional, Transitional, & Personalized
Traditional Environment
Personalized Environment
PL Standards
CCSS for ELA
Next Generation Science Standards
Biomes in Action
One Class's Journey
Personalized Science Classroom

**Assessment**
Standardized Assessment
Formative Assessment
In a Personalized Learning Environment

**SAMR Model**
Substitution & Augmentation
Modification & Redefinition

**Success Story: Oakland Unified**
At a Glance
Devices
Personalized Learning Program

**Success Story: Pasadena ISD**
At a Glance
The Shift Towards Personalized Learning
Personalized Learning 101

What is Personalized Learning?
A variety of instructional approaches and academic support strategies to address the distinct learning needs, interests, aspirations, or cultural backgrounds of individual students.

Characteristics of Personalized Learning Environments:
• Student-centered instruction
• Engagement in real-world activities that promote content learning
• Student choice and control
• Formative assessment throughout the learning cycle
• Seamless integration of technology into learning experiences

Why Implement Personalized Learning?
• To improve student achievement
• To help students meet academic standards
• To address the needs of all students
• To engage students by connecting their out-of-school and in-school lives
Personalized Learning 101

Fiction
Students decide what they want to learn
All students work individually on tasks designed for them
Students do not receive grades
Students are free to take the easiest path to learning

Fact
All students meet standards but make choices in addition to and within those standards
Students work with small and large groups, as well as alone
Students participate in a variety of formative and summative tasks, in addition to grades
Self-directed learning and meeting challenges are important components of personalized learning
Personalized Learning 101

7 Things to Know about Personalized Learning

1. Personalized learning is a 21st century form of differentiation, refreshed with technology
2. Personalized learning focuses on academic standards
3. Students are already personalizing their own learning
4. Personalized learning is not a curriculum or a program, but a way of thinking about teaching and learning that can transform classrooms
5. Technology is a critical tool for personalizing learning
6. Personalized learning can transform teaching
7. Personalized learning is worth the effort
Personalized Learning 101

“The infiltration of a sweeping range of different technologies into our everyday lives has created an expectation that all interactions should be highly personalized to meet our individualistic needs. The evidence of these expectations is commonplace now and for many, no longer is it a ‘wonder of technology’ surprise.”


Benefits of Personalized Learning in a 1:1 Environment

- Support for student-centered instruction
- Student engagement and ownership
- Development of 21st century skills such as collaboration and self-direction
- Student interest in and proficiency with technology
- Access to student data that can drive teaching and learning
Personalized Learning 101

Technology Integration

- Students have access to online resources that enable them to make choices about content
- Mobile devices allow students to access resources and complete tasks anytime and anywhere
- Online tools and apps expand the ways in which students can demonstrate their learning
- Working with technology prepares students for life and work in the 21st century

“Students, perhaps without even realizing it, are already seeking out ways to personalize their learning. Looking to address what they perceive as deficiencies in classroom experiences, students are turning to online classes to study topics that pique their intellectual curiosity, to message and discussion boards to explore new ideas about their world, or to online collaboration tools to share their expertise with other students they don't even know” (Project Tomorrow, p. 1).
In the Classroom

Traditional Classroom
• Students work occasionally with partners or groups on short activities
• Sometimes students choose from a set of options (e.g., problems or readings)
• Students use rubrics to self-assess their work
• Technology is used mostly for research

Transitional Classroom
• Students work on 1-2 group projects a year
• Students use different tools to assess their learning
• Students often use technology to communicate and collaborate as well as to demonstrate learning

Personalized Classroom
• Students frequently make choices about projects in a variety of contexts
• Students set goals for content and 21st century skills, monitor their progress, and reflect on their learning
• Technology is seamlessly integrated throughout instruction
Megan and Tyler are middle school students in earth science classes at two different schools studying tectonic plate theory. Megan's school takes a traditional approach to instruction while Tyler's school uses a 1:1 computing model to personalize learning.

Megan completes the following activities in a traditional learning environment:

- Reading from a textbook and completing end-of-chapter questions
- Listening to teacher lectures
- Watching videos on tectonic plates
- Participating in whole-class Q & A reviews
- Completing a study guide
- Taking a unit exam

Megan learns the following content knowledge & skills:

- Facts about tectonic plates
- How to read a textbook
- How to find answers to fact-based questions
- How to memorize information
- How to study for and take tests
- Managing time for studying and completing homework tasks
In the Classroom

Tyler completes the following activities in a personalized learning environment:

• Setting personal goals for content and 21st century skills
• Investigating tectonic plates with online searches
• Developing and answering a research question
• Working with a group to conduct research about a topic of interest related to tectonic plates
• Conferencing online with a geologist
• Developing a digital model to explain the research
• Presenting findings to peers and community members

Tyler learns the following content & skills:

• How tectonic plate theory explains the world he lives in (Next Generation Science Standards)
• Asking questions that can be answered with research (NGSS)
• Developing a model to explain a natural system (NGSS)
• Collecting, analyzing, and interpreting data (NGSS)
• Project planning
• Metacognition, goal setting, and reflection
• Time management
• Technology literacy
• Creativity
• Collaborating with peers and adults (NGSS)
• Communicating a scientific argument (NGSS)
Personalized Learning and Standards

Mathematics
- Focusing on conceptual understanding of fewer topics encourages more in-depth study allowing for student choice
- Standards on developing procedural knowledge and metacognition support goal-setting, self-knowledge, and self-direction
- Emphasis on application of knowledge and skills to real-world problems promotes engagement and deep understanding

English Language Arts
- Close reading of different kinds of complex texts, specifically non-fiction, promotes student engagement and real world application
- Emphasis on reading and writing skills and strategies rather than specific works of literature and types of writing supports student choice
**Standards**

**Next Generation Science Standards**
- Decreased emphasis on facts and vocabulary supports in-depth exploration of science concepts
- Emphasis on connections among different areas of science creates a realistic view of scientific thinking
- Application of scientific concepts to the real world encourages student engagement, critical thinking, and student choice
- A focus on developing scientific arguments connects science to the real world

**National Council of Social Studies Standards**
- Decreased emphasis on names, dates, and events, and increased emphasis on themes and concepts allows students to pursue areas of interest
- Common Core State Standards for literacy support the use of primary sources and communicating ideas

**All new standards support personalized learning with the following emphases:**
- Collaboration
- Creativity
- Critical thinking
- Application of knowledge to real world situations
- Formative assessment to guide instruction
- The use of technology to self-manage and solve problems
In the Classroom: Biomes in Action

Next Generation Science Standards

- HS- LS2 Ecosystems: Interactions, Energy, and Dynamics
- HS-LS4 Biological Evolution: Unity and Diversity
- HS-ESS3 Earth and Human Activity

Students take the role of environmentalists and work in groups to develop solutions to contemporary environmental problems. Students:

- Research the features of a specific biome
- Investigate the human impact and its harmful effects on the biome
- Analyze the problems of human encroachment
- Examine scientific evidence in order to propose solutions
- Present their solutions in multimedia formats
One Class's Journey

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Personalized Science Classroom

To begin a unit on energy sources, a science teacher invites the owner of a solar energy company to speak to the class. The students will use the talk to generate questions they would like to research on energy options.

After a class discussion, using a rubric that defines the standards and expectations they are supposed to meet, students in small groups choose a relevant issue to investigate, such as a type of energy, a political point of view, or a device. To show their learning they will create a digital product of some kind.

In their groups, students set individual and group goals, create a project plan, monitor their progress, conduct research, and assess how they are doing. They share their projects to get feedback from peers and publish their work to the class Web site. To ensure individual accountability, students also take a unit exam.
Assessment

Assessment & Personalized Learning: Standardized Assessment

“Standardized testing is only a measure of a point in time in a specific category of material on a test—not an accurate measure of students' actual achievement or level of knowledge gained. A more personalized, differentiated approach to assessing students' performances provides a holistic assessment of students' full cognitive achievements and abilities” (Alberta Education, 2012; Personalized Learning, p. 73).

Educators want to know which curriculum works, which instructional techniques are most effective, and which lessons get through to students.... Personalized learning allows for testing that boasts richer and more relevant questions, more efficient scoring capabilities, improved test security, greater equity via electronic accommodations, results that let students know whether they are on track, and opportunities to personalize instruction, based on detailed, timely feedback (Bailey, Schneider, & Vander Ark, 2012; Personalized Learning, pp. 73-74).
Formative Assessment

Assessment and Personalized Learning:
Formative Assessment

“There is a body of firm evidence that formative assessment is an essential component of classroom work and that its development can raise standards of achievement” (Black & Wiliam, 1998; Personalized Learning, p. 75).

Formative Assessment: Purposes

• Gauging student needs
• Developing 21st century skills
• Monitoring student progress
• Checking for understanding

Formative Assessment: Strategies

• Self- and peer assessment
• Rubrics
• Checklists
• Project plans
• Observation
• Conferences
• Informal questioning
• Quizzes and surveys
• Portfolios
In a Personalized Learning Environment

Turning Points in History

In a world history class, student groups select the three most important turning points in European history from 1500 to 1939. They use historical research and reasoning to form their arguments and participate in a mock debate defending their choices.

Assessment

- The teacher questions students formally and informally throughout the unit to determine their understanding of content
- Students use an argumentation rubric to self- and peer assess their reasoning
- The teacher assesses information literacy, collaboration, and critical thinking through observation throughout the project
- Students reflect on their learning and take a final unit essay exam
Substitution & Augmentation

**Substitution:** Technology is used for tasks traditionally completed on paper, such as taking notes, taking tests, or writing a report.

**Augmentation:** Technology is used for traditional tasks but with added benefits due to technology, such as getting immediate feedback on a quiz or choosing a video to watch on a mobile device instead of in the classroom.

**Benefits**
Teachers and students learn basic technology skills.

Teachers can “dip a toe” into personalized learning and can build confidence to move forward.

**Benefits**
Teachers may use technology to give students some choice about what and how they learn.

Teachers and students continue to develop technology skills and build confidence.

They may begin to experiment with other uses of technology for learning.
Modification & Redefinition

**Modification:** Technology is used to significantly re-imagine learning activities. Students are encouraged to create digital products to show their learning or to collaborate with peers and adults in and out of the classroom.

**Redefinition:** Students create products that would not be possible without technology.

**Benefits**

- Students complete projects that could not be done without technology
- They develop information literacy and technology skills valuable for the future
- They use technology to create, communicate, and collaborate
- Students learn content knowledge and skills by making choices, planning, monitoring their progress, and assessing the quality of their work
Success Story: Oakland Unified

At a Glance

Oakland Unified School District serves:

- 48,181 students (district-run and charter-run)
- 2,158 teachers
- 118 schools (district-run and charter-run)
- 73% of the students receive free or reduced-price lunch
- 31% are English language learners and 50% of speak a language other than English at home. In all, over 100 different languages are spoken.

Infrastructure:

- As of 2015, 13,000 Dell Chromebook 11 models had been distributed to students
- 3,000 HP Chromebook 14 G3 Touch devices have been issued to all teachers and principals across the 86 district-run schools
- A total of nearly 3,500 Meraki wireless access points have been installed. Every classroom has wireless.
- A new wired LAN with Cisco switches serves as a backbone. Comcast is providing a minimum 1Gbps egress from each site. The district has dual connections to the Internet totaling 40 Gbps.
- OUSD is now at a 1:3 ratio of computers to students. Some schools are 1:1; others are 2:1, and many have a mix of Chromebooks, Windows computers, and iPads
What does personalized learning look like and how can it help our students? That’s a question that California’s Oakland Unified School District (OUSD) began asking itself several years ago. With help from the Rogers Family Foundation, the district began working on blended and personalized learning pilots in several of its schools.

To choose the devices for OUSD’s personalized learning initiative, a team evaluated various options and quickly narrowed in on Chromebooks because of their affordability and ease of use. At the same time, the district worked on installing the infrastructure that would be needed for widespread implementation. In 2014 a major upgrade deployed 3,500 Meraki access points—including at least one for every classroom.

Once the groundwork was laid, it was time to figure out which Chromebook was the best fit. “For us, having the Intel power was really important,” says district CTO, John Krull. “We compared against other chips and did internal performance tests at SpeedBattle.com. The Intel-based Dell 11 Chromebook came out on top, performance-wise.”
Personalized Learning Program

The district also created a position for a director of personalized learning, Stacey Wang, to support the schools internally and continue figuring out how to define personalized learning for the district. “We're taking the time to do it right,” she says. “We're thinking through what the how should look like and what the what should be.”

Wang shares an example of the ways in which doors can open with help from the technology: “Last year, on the first day of school, we had a third-grade student who was a newcomer to the U.S. and spoke no English. His dad was hovering, nervously, as the boy struggled to get settled. Every other student was using ST Math, an innovative, adaptive online program, so we gave him a Chromebook, logged him in, and got him started on ST Math as well. Within minutes, he waved his dad away,” says Wang. “He ended up having a great first day due to technology providing an opportunity for him to access learning in a way that bridged the language gap.”

The breadth and depth of a personalized learning program is ultimately dependent on its vision, infrastructure, and capacity for sustainability. And the level of personalization of your learning program will ultimately be determined by your school's technology capacity. In a 1:1 scenario, every child can have a personalized learning plan. This can play out simply, with teachers utilizing Google Apps for Education to store individualized assignments, or through adaptive software or digital platforms. If there aren't enough devices for every student, use the devices available for small group instruction or rotate students through a device station to work on individualized assignments and assessments.
Success Story: Pasadena ISD

At A Glance:

Pasadena ISD has:

- 63 schools: 35 elementary, 8 middle, 10 intermediate, 5 high, 4 alternative, and 1 Career & Technical high school
- 54,382 students: 82% Hispanic, 7% African American, 7% White, 3% Asian
- 26% Bilingual/ESL; 18% Career & Tech, 9% Special Education, 5% Gifted
- An 89% Graduation Rate
- Pasadena ISD high school students earned top places in national and international Career and Technology competitions
- Pasadena ISD was named a leader in music education for five consecutive years by a national survey sponsored by the NAMM Foundation and its AMC division

Infrastructure:

- More than 18,000 students in grades 7 through 12 have a Dell Venue 11 that they are allowed to take home. It’s a Windows 8 touch tablet with a digital ink active stylus and a keyboard
- More than 2,000 students in grades 5 and 6 have Dell Latitude 3150 notebooks that they leave at school. This is a three-campus 1:1 pilot
- At the elementary (K-4) level, there are approximately five computers in every classroom, as well as laptop carts
- There are more than 350 Promethean boards in classrooms around the district
The Shift Towards Personalized Learning

“The factory model is not productive. We’ve been moving toward blended learning and will eventually get to personalized learning for everyone,” says Vickie Vallet-McWilliams, director of instructional technology at Texas’ Pasadena Independent School District (PISD).

To make the shift to blended/personalized learning, PISD has held teacher academies and summer training sessions so that teachers learn everything from why this type of learning is so effective to how to work with real-time data to individualize lessons. Just like any large district, some teachers are further along the learning curve than others. Valet-McWilliams says the teachers who are already teaching in a blended or personalized environment tell her that their students love to learn this way and that they hope to never go back to the factory model again.

“Our 1:1 is leading us to personalized learning, where children learn at their own pace and teachers use data for immediate recovery,” says chief technology officer Steve Wentz. “We’re trying to give as much flexibility and mobility as we can.”
Adaptive Learning

Getting Started
Definition
Methods

Personalizing Instruction
Structure & Schedule
Empowering Teachers
Technology & Adaptive Learning
Practices & Products

Core Components
Models
Levels
Getting Started

Definition

The U.S. Department of Education Office of Educational Technology defines adaptive learning systems as follows:

“Digital learning systems are considered adaptive when they can dynamically change to better suit the learning in response to information collected during the course of learning rather than on the basis of preexisting information such as a learner’s gender, age, or achievement test score. Adaptive learning systems use information gained as the learner works with them to vary such features as the way a concept is represented, its difficulty, the sequencing of problems or tasks, and the nature of hints and feedback provided.”

Methods

It can be difficult for a single teacher to personalize learning for every student in the classroom. With the increasing classroom access to tablets, laptops, and desktop computers has come a wide assortment of software promising to help teachers with this daunting task.

Some educational software claims to be “adaptive,” a word that has come to mean many different things. Simply stated, adaptive learning software adjusts the learning content or assessment items it presents to each student based on observations made of student performance. Adaptive learning systems are designed to provide students with an appropriate level of challenge, as well as the right amount of support. The optimal learning zone lies between the student’s comfort zone and the frustration zone. Too little challenge, and the student will quickly lose interest. Too much challenge, and the student will become frustrated and more likely to give up.
Getting Started

To determine the appropriate level of challenge, adaptive learning systems may employ one of several methods. One type of adaptive learning method is called “single point adaptivity.” In this model, a student’s performance is evaluated at one point in time in order to determine the level of instruction or material he or she receives from that point on. Another method is called “continuous adaptive learning,” in which a student receives recommendations of learning material based on performance data collected in real-time.

Adaptive learning software shares much in common with traditional private tutoring. The software can provide supplemental instruction and coaching to students on a one-on-one basis. It can quiz a student, identify areas of weakness, and provide tips to help him or her to remember key concepts. Highly adaptive learning software can help students to get unstuck on a particular step in solving a math problem. Perhaps most useful to teachers, adaptive learning software can pinpoint exactly what students are doing well and where they might need extra help and support.
Personalizing Instruction

Structure & Schedule
When considering ways to utilize adaptive learning software to personalize instruction in a classroom, it is a good idea to lay out a structure and schedule. Some portion of the school day needs to be set aside for students to use the adaptive learning software. This is known as “blended learning.” Blended learning is an arrangement in which a student learns part of the time through computer-based delivery of content and skills practice. While the student is using the software or online service, he or she has control over the pacing and sequence of the learning. It is important for teachers that they understand how adaptive learning software works before implementing it in their classroom. Understanding how the software works enables a teacher to identify which teaching functions the software can fulfill and which it can’t.

Empowering Teachers
Adaptive learning systems can empower teachers to do their jobs better and give students richer educational experiences. They are not intended as full replacements for teacher-led classes, but they can support a shift in the role of the teacher in the classroom. The teacher's role can shift from providing whole group instruction to supporting students as they work on their individual learning paths.

Adaptive learning systems have a variety of features that make them valuable educational tools for both students and teachers. One feature of even the most basic level of adaptive learning software is instant feedback. Students are less likely to lose focus if feedback is immediate and personalized, something that can be difficult for a classroom teacher to provide. Adaptive learning courses often include game elements such as progression bars, badges, and unlockable achievements. This type of gamification can motivate learners as they tackle new concepts and rewards them for effort and sustained attention.

Many adaptive learning systems provide dashboards to teachers and administrators that report data on where students are struggling. The instructor can use this precise understanding of a student's particular weaknesses to direct their coaching and intervention. These dashboards provide two more benefits: discovering classroom trends and helping teachers more effectively group students by performance, goals, and skills.
Personalizing Instruction

Technology & Adaptive Learning

As technology use increases in the classroom, more data is captured about student activities throughout the learning process. This information can be used to create individualized learning pathways for students. Systems that attempt to automate this process are called adaptive learning systems and have the potential to drastically change how we educate students.

Adaptive learning systems automate tasks traditionally reserved for teachers, from choosing content to providing just-in-time support. These systems are gradually transitioning from linear, rules-based systems to more complex, algorithm-based systems able to base decisions on more and more data events.

More technology use in the classroom equates to more data captured about student activity throughout the learning process.

Adaptive learning systems can use this data to automate tasks traditionally reserved for teachers.

This same data can also be used by students, teachers, administrators, and parents to create learning goals.
Practices & Products

Personalized Learning describes Practices

- Less class time taken up by announcements and lectures
- More class time used for conversation
- Less work assigned for students to complete outside of class
- More observation of work done by students during class time
- One-on-one tutoring/coaching provided to all students, either by a human instructor or by software

Adaptive Learning describes Products

- Students can use software and online services outside of class to interact with content traditionally covered in lectures
- Dashboards and reports generated by products give teachers a view into class-wide trends and individual progress made by students
- These products function partly as tutors by providing interactive feedback and recommended learning paths
Core Components

Models

• An adaptive learning system involves at least three components:
  • A model of the structure of the content to be learned (the Content Model)
  • A means of understanding student abilities (the Learner Model)
  • A way to present content to the learner in a personalized and dynamic fashion (the Instructional Model)

Content Model:

Adaptive learning systems need substantial content tied to standards and learning objectives to use with learners

Learner Model:

Adaptive learning systems need to gather info about the learners themselves from simple (what students know) to complex (how students best learn)

Instructional Model:

Adaptive learning systems need to make decisions about next instructional steps, and get the right content to the right learner at the right time
Core Components

Levels
Adaptivity is a buzzword with a wide variation in meanings. While it is true that more adaptive learning programs can better adapt to the specific needs of individual students, levels of adaptivity are not indelibly linked to levels of personalization.

Basic
- Pre-tests and post-tests assess understanding
- Content is the same for all students, but appropriate content is assigned to individuals at the right time

Moderate
- Provides feedback through hints, additional resources, and questions
- Rule-based forking attempts to get the right content to the right student
- Dashboard displays multiple data events

Advanced
- Analyzes more involved response types to correct students at point of misconception
- Algorithm-based system interprets multiple data points
- Improves over time with additional data by generating user profile
Digital Curriculum

Roadmap
- Common Steps (Part 1)
- Common Steps (Part 2)
- Common Steps (Part 3)
- Common Steps (Part 4)
- Common Steps (Part 5)

Instructional Delivery
- Scenarios

Digital Curriculum Checklist
- Vision & Timeline
- Decide & Define
- Evaluate & Organize
Roadmap for Planning and Implementation

Common Steps (Part 1)

How can you shift your educational institution to using more digital content, or even go entirely textbook-free? The path isn't the same for every school, but there are some common steps to take. This planning framework is designed to help school leaders and teachers successfully implement digital content into their learning curriculum.

Step 1: Develop a Team

The first step to going digital is to develop a strong network of professionals working together to support the various components of a digital program. A well-defined team that meets regularly will move the objectives of a district forward. In addition, the team should be advised by a broad-based community group.

Step 2: Develop a Plan

The next step is to establish goals, objectives, strategies, and measurable outcomes for the use of digital content. First, begin by analyzing your current digital content program. Next, identify your instructional objectives. Then, move to content and instructional decisions.

Step 3: Build the Infrastructure

To take full advantage of today's technological devices, you need to build a strong infrastructure and provide reliable, fast WiFi. Making the shift to digital content will inevitably increase the number of networked devices in your school, creating heavy demands on your network infrastructure. Contact local vendors and network specialists to determine the best set-up for your district goals, existing infrastructure, and budget.
Roadmap for Planning and Implementation

Common Steps (Part 2)

Step 4: Build a Digital Curriculum
Once your infrastructure is in place, you’ll need to look at the material you wish to provide to students. Rich digital content can take many forms. It can be provided in standards-based packages that build upon textbooks, with teacher’s guides, assessments and multimedia content all included and aligned to standards. It can be created collaboratively, in open source format, by a variety of experts. Or it can be drawn from multiple sources—subscriptions, free online resources and other digitized material—customized locally to meet the needs of a particular classroom, grade or district.

Digital Classroom Models
Having a digital curriculum allows districts more flexibility in how they offer courses and classes. Some options include:

Online Learning
Instruction by a web-based educational delivery system provides a structured learning environment. It may be accessed from multiple settings in or out of a school setting. It expands educational options for students with wider course offerings, new formats, and an extended learning community.

Blended Learning
Blended learning combines online learning with other modes of instructional delivery. Rather than learning online at a distance, students learn in an adult-supervised school environment for at least part of the time. A blended learning model places value on the teacher’s face-to-face interactions with students.

Face-to-Face
Even though students come in to a physical classroom, they can still participate fully in a digital curriculum with self-paced learning if needed. Teachers may choose to place students in small groups where they use technology tools to direct their own learning.
Roadmap for Planning and Implementation

Common Steps (Part 3)

Step 5: Consider Devices
Once a digital curriculum is established, districts must decide which devices best fit their educational goals and digital requirements. Budget-conscious schools might be tempted to purchase “inexpensive” eBook readers or netbooks with fewer features than full-fledged computers, but such a move can actually cost a district more if the new devices do not meet all the needs of the students or teachers who will be using them. In selecting a mobile device for classroom use, it is important to view it as a total learning platform and look for a device that supports a variety of curriculum uses, not just one of them.

Step 6: Learning Management Systems (LMS)
Digital content is increasingly being organized through an LMS, or learning management system. A learning management system is an online platform that enables the delivery of materials, resources, tools, and activities to students both in and out of the classroom environment. It allows teachers to offer tailored instruction that can be accessed by students anytime, anywhere without geographic constraints. While the online environment of an LMS shares many features with traditional teaching and learning, it also has some unique attributes, such as flexibility (anytime, anywhere) along with time for reflection and learners’ anonymity. Additionally, learning management systems offer the convenience and support of a common system used by teachers, support staff, students, and parents. Many K-12 districts say they are starting to use a LMS due to the Common Core State Standards, which emphasize digital assessment and personalized instruction. An LMS allows districts to easily track, modify, and share student information. It can also be used as an organizational tool for all of a district’s digital content, resources, and professional learning communities.
Roadmap for Planning and Implementation

Common Steps (Part 4)

Step 7: Security & Privacy

Making the move to digital content brings with it a host of security concerns, including data protection and compliance with the Children’s Internet Protection Act (CIPA).

Protective wireless infrastructure for a digital program provides a segmented student network that is separate from the one used by teachers and administrators, thereby avoiding data security conflicts and protecting student information. Built-in authentication procedures enable monitoring of Internet usage while ensuring that only legitimate users are allowed to access the network.

Successful school technology programs have strategies in place to help with classroom management of different devices and activities. They establish and communicate an acceptable use policy (AUP) that specifies where and when devices can be used, as well as policies for social networking and messaging. If your district plans to open your schools to student and staff-owned devices, previous versions of the district AUP must be updated to address specific BYOD policies.
Roadmap for Planning and Implementation

Common Steps (Part 5)

Step 8: Teacher Training

For a digital curriculum to succeed, it needs to be taught effectively. This requires both teacher buy-in and ongoing professional development. Without proper professional development, a digital curriculum may not live up to its expectations. Simply filling a classroom with technology devices, or inviting student-owned devices into school, does not raise achievement; rather, it’s how teachers choose to implement the devices that can determine if a digital curriculum succeeds or fails.

After implementing a digital curriculum, establish a plan to provide ongoing professional development and extensive training for staff members who are responsible for implementing the program and procedures on a daily basis. Teachers who may be more comfortable with print texts and traditional teaching methods will require a new skillset of digital classroom management strategies and a greater depth of knowledge about technology.
Instructional Delivery

Scenarios
With game-based learning, online lessons, virtual simulations and multimedia, digital content can help students engage in personalized learning experiences at school and at home.

Student Scenario
A student arrives at school and promptly logs in to the school’s LMS, where she checks the school calendar and reads the morning announcements via an embedded microblog feed on the front page. When her first class begins, she opens the digital course textbook on her tablet and begins reading about the evolutionary biology of primates. During her reading, she follows hyperlinks that define technical terms and connect to pages on related topics.

While she is reading independently, the classroom teacher is meeting with a small group of students to perform a hands-on demonstration. Another small group of students is watching an instructional video online and completing a follow-up assessment where they receive immediate feedback and remedial instruction if needed. After 15 minutes, the groups rotate.

Near the end of class, the teacher posts a series of study questions online using a collaborative document tool. She assigns the questions to different students, who will later complete the document together using real-time editing from their own home computers. Meanwhile, another student is preparing for his morning Algebra class. He has a quiz today, but he is confident that he will perform well. During the past week, he has been watching Algebra lessons online from an experienced teacher. When something in the lesson confused him, he stopped and replayed the point over again. The follow-up practice exercises with immediate feedback helped him identify his weakest areas, which he addressed with online tutors.

Today, he takes his quiz online using a laptop from the classroom mobile cart. The quiz program selects questions for him based on how long it takes him to complete each question and what type of questions he has missed. The teacher receives immediate feedback on how the students are performing, what areas need to be improved upon, and common mistakes. She uses this data to plan the next day’s instruction. After completing his quiz, the student receives a report that details his performance by topic and provides a list of recommended areas of study. He reflects on his performance and makes personal goals for the next quiz.
Digital Curriculum Checklist

Vision & Timeline
Use this checklist to evaluate your school's readiness for a digital curriculum.

Define Your Common Vision
• Is the ultimate goal to transition to an all-digital curriculum, or is your school planning to adopt a hybrid (print + digital) future?
• What device implementation model will you use?
• Will the school have a computer lab or mobile device carts?
• Is the goal to be 1:1? Will the school finance this or simply allow students to bring their own devices (BYOD)?

Make a Timeline
• What is your timeline for going digital and what is driving that timeline?

Know Your Policy
• What is your state's current policy on using state-mandated funding for technology purchases?
• How much of your state's textbook funding can be used to finance eBooks and other digital content?
Digital Curriculum Checklist

Decide & Define

• What ideas are other districts trying? Is it working?

• Are there successful models of digital migration that you can learn from? Try not to reinvent the wheel

Decide on the Digital Content

• What kinds of digital content are included in your strategy?

• Will you use commercial content, open source content, or a combination of both?

• Does this content align with the school's digital content goals and intended outcomes?

Decide on Devices

• Have you considered the advantages and limitations of different mobile devices?

• What devices best fit the intended goals and outcomes of your digital program?

• Will students be required to access the digital content from home? Will the school provide loaner devices to students who need them?

Define Operational Procedures & Processes

• How will devices be managed? Who is responsible for inventory?

• What will be the procedure for purchasing new devices?

• How will devices be allocated to ensure equal access among students?
Digital Curriculum Checklist

Evaluate & Organize
• What is the school's common definition of quality content?
• Has the content been evaluated? If so, by whom?
• If not, is there sufficient testimony from similar school districts so that your team can predict if it will work in yours?
• Is the content aligned to the standards?
• Have the school's teachers and other instructional leaders checked out the authenticity and accuracy of the material?

Organize the Digital Content
• How will students access their digital content? Would your school benefit from an LMS or other learning portal?
• How will students access digital content from home?

Rethink the Curriculum
• What areas of the curriculum need to be redesigned in order to fully implement digital content in a way that will enhance and enrich students' learning?
• Does your current pedagogy match your digital learning goals and objectives?

Plan for Professional Development
• Do you have adequate teacher buy-in?
• Are your professional offerings aligned to the goals established by the district?
• Have you considered a variety of offerings to meet teachers with different levels of expertise?
• Are you prepared for long-term professional training and follow-up?

Develop & Maintain Responsible Behavior
• Have you established anti cyber-bullying policies?
• Have you updated your school's acceptable use policy (AUP) to include specific issues related to digital content, such as plagiarism, Fair Use, and copyright?
• How will students be instructed about responsible sharing, for example, Creative Commons Licensing?
OER (Open Education Resources)

Overview
Open Practice
Benefits

Modifying Open Textbooks
Considerations
Editing
Sharing

Localization
Fulfilling Learning Goals
Flexible Formats
Overview

Open Practice

“There is the possibility for open practice to allow students to more directly own their own learning in a broader sense. Openness in learning can help students to be more collaborative, more proactive and more independent, skills that will benefit all of us beyond just the walls of school.” — Karen Fasimpaur, educational consultant for K12 Open Ed

Open Educational Resources (OER) are teaching and learning materials that are freely available online for everyone to use and can be remixed, revised, and redistributed at no cost.

Unlike traditional curricular materials, which are copyrighted and fixed, OER have been authored by an individual or organization that chooses to retain few, if any, ownership rights. OER often have a Creative Commons or GNU license that explains how the material may be used, reused, adapted, and shared.

OER encompass a wide variety of educational materials, including:

- Full university courses
- Interactive mini-lessons and simulations
- Adaptations of existing open work
- Electronic textbooks
- K-12 lesson plans, worksheets, and activities
Overview

Benefits

As more K–12 teachers, administrators and district leaders become aware of OER, the more eager they are to embrace the model. OER provide opportunities to update and adapt materials to meet different student needs, spurs innovation in open learning practices, and reduces content acquisition costs.

Benefits of OER

The most immediate benefit of OER is access to quality teaching and learning materials, often in multimedia formats, at little or no cost. OER provide an alternative to costly textbooks and might lead to significant savings for schools. OER enable educational leaders to shift costs: Instead of using funds to purchase or lease instructional materials, money can be directed to fulfill other needs, such as building technology capacity. While OER are not synonymous with digital resources—many OER programs are designed to be printed and used in that format—the best potential for cost-shifting lies in digital distribution (Insights, 2016).

Openly licensed material also gives schools and districts many different technology options for implementation, from 1:1 models to BYOD and even flipped classroom programs. Karen Fasimpaur, an educational consultant with K12 Open Ed, explains: “The great thing about OER as opposed to commercial digital content is that the content can be modified and deployed under all of these scenarios and ones we haven’t even thought of yet.”

In addition to reducing student costs, OER can positively affect retention rates when teachers adapt the resources to best meet the needs of their student population. The collaborative nature of OER can provide a rich, robust, high-quality learning experience that is pedagogically sound and better designed than what can be developed by individual teachers. The benefits of OER have global implications as well. International organizations and governments see an opportunity in OER to widen access to high-quality teaching and learning resources in poor countries or among disadvantaged communities of learners.
Modifying Open Textbooks

Considerations

Modifying or adapting open textbooks is a smart way to ensure that the resource meets your unique needs. Some general consideration before adapting a textbook include:

- Choose tools that output to flexible formats such as ePub, PDF and HTML
- Don’t change more than is necessary, as a textbook can be modified incrementally over time

First Things First

- Check the textbook’s license to ensure you have the permission to adapt the resource. If the resource has a No Derivatives clause, then it is best to avoid making modifications
- Be sure you have the textbook in a technical format that you are comfortable working with, such as the original source files (HTML, Word, Text, ePub, etc.)
- Many textbooks are in PDF format, which is not conducive to editing and must be converted to an editable format
Modifying Open Textbooks

Editing

Tools to consider when editing textbooks include:

- PressBooks: A web-based authoring tool that allows users to import a number of different formats—such as ePub, HTML and Word—and output the textbook as an ePub, PDF or mobile-friendly website. Other tools include: Microsoft Word, OpenOffice, ePub, Google Docs, ScribeTex, TeXworks, Texmaker, MediaWiki, and Dreamweaver.

Students like flexibility when it comes to their textbooks. Some may prefer printed versions of the textbook, while others may prefer using a website. Still others will like to use an e-reader or e-reading software.

Licensing Considerations

After making your modifications, your textbook should use the same type of Creative Commons license as the original textbook so that it is compliant with the original terms of use.

Sharing

Try making your textbook available in multiple formats so students can choose the format that's right for them: ideally, something that can be viewed as a website, or on an e-reader or—as with a PDF—printed.

After modifying a textbook, it needs to be hosted somewhere so that it can be accessed. For example, if your textbook was created using PressBooks and you are part of the BCcampus open textbook project then your textbook can be hosted on the open.bccampus.ca website.
Localization

Fulfilling Learning Goals

The practice of localization involves adapting an educational resource for a new context—such as geographical or pedagogical—and is more than just mere translation. Localization is about capturing diversity and relevance.

Localizing can fulfill many learning goals, such as adapting for various grade levels or disciplines, addressing learning styles and diversity needs, or adjusting for various learning environments.

This process is just another way of customizing materials so that they meet specific teaching and learning needs. And sharing these modifications—imbuing them with your unique contextual experiences—makes a valuable contribution to the evolution of these textbooks and learning materials!

It might seem hard to imagine how someone might utilize your materials when developing or adapting your own resources: especially educators from different geographic locations or circumstances. But there are ways to create OER resources that make it easier for someone else to localize them for their own purposes.
**Localization**

**Flexible Formats**

Creating files in flexible formats, such as HTML or Microsoft Word, makes your resources more easily utilized and modified. HTML documents can be viewed on a web browser, while Microsoft Word documents can be saved as text (.txt) or rich text (.rft) format files and opened with any word-processing program.

Submit your resources to a repository such as OER Commons so that educators can more easily find your materials, searching by criteria such as subject area and grade level. Try searching OER Commons or a similar OER site yourself to see how others might locate your materials. Licensing your work using a Creative Commons license also allows others to use and modify your materials while still attributing you as the author.

Finally, think about the benefits of localizing content at the individual, school, or district level. What considerations could you keep in mind to make content easier to reuse in various teaching and learning situations?
Personalized Learning: A Guide for Engaging Students with Technology

This guidebook is designed to help today's educators and administrators understand the concepts behind personalized learning, and to share with them the strategies, policies, devices, services, techniques and resources available to transform teaching into something more relevant, more powerful, and more rewarding.

Get Active: Reimagining Learning Spaces for Student Success

The comprehensive research, real-world examples, insights and exercises contained within the pages of this guidebook provide that crucial first step for any educator or administrator looking to support today's learners with active learning concepts that will best prepare them for tomorrow's world.