
LEARNING REDISTRIBUTED

CREATING EDUCATIONAL EXPERIENCES
THAT TRANSCEND THE TRADITIONAL CLASSROOM

by Tamara Closs and Phil Puthumana



JENNY WANTS TO BECOME A BIOLOGIST.

JENNY LIVES IN A RURAL TOWN IN NEW MEXICO.

HER SCHOOL DISTRICT CAN'T AFFORD STATE-OF-THE-ART LAB FACILITIES, SO JENNY ATTENDS A "COLLABORATORY" WITH STUDENTS FROM ALL OVER THE U.S., USING AN ONLINE VIRTUALIZATION TOOL TO PERFORM COMPLEX DISSECTIONS, AND EXCHANGING OBSERVATIONS WITH HER LAB PARTNERS VIA VIDEO CONFERENCING. **SHE ALSO REGULARLY VISITS THE GREAT HISTORY AND SCIENCE MUSEUMS OF THE WORLD VIA VIRTUAL TOURS.**

For a student like Jenny, the education of the future is happening now. In a global, always-connected, information-rich world, learning is always accessible. The concept of localized education—learning that takes place at a specific time, in a specific place, with a purpose defined by a specific entity—is rapidly changing.

Even in the face of diminishing budgets and excessive workloads, K-12 educators have found ways to integrate technology into their classrooms, using tools and resources from digital authoring technologies to smartphones. However, these episodic efforts are sometimes limited by the confines of the traditional classroom.

Many of today's students have never known life without the ability to connect, communicate, and explore 24x7. For these digital natives, the highly interactive, experiential environment is the norm. They are accustomed to the immediacy of information sharing from a device in the palm of their hands. Technology isn't a tool to them—it's the building block of learning and social interaction.

PEW INTERNET AND AMERICAN LIFE PROJECT

The Pew Research Center's Internet American Life Project, a nonprofit, nonpartisan research organization, provides free data and analysis on the social impact of the Internet.

1 Over 95 percent of teens aged 12 to 17 are now online.

2 Over 62 percent of them use wireless and mobile devices for digital activities away from home or work.



RELEVANCE IN THE DIGITAL AGE

TO KEEP K-12 EDUCATION RELEVANT AND EFFECTIVE IN THE DIGITAL CULTURE OF OUR STUDENTS, WE SHOULD CONSIDER THESE THREE AREAS FOR POTENTIAL DEVELOPMENT:



1

Liberation from proximity.

Living in a rural area or within a resource-constrained school district need not be a liability for students. Tools like video conferencing, screen sharing, and interactive applications can allow them access to virtual laboratories, complex simulations, and interaction with a wider community of learners and teachers. Mobile technology—like smartphones, netbooks, and tablets—makes it even easier for students to access their assignments from virtually anywhere, at any time.

2

Full and equal participation.

When online communities form around shared ideas, participants move fluidly between the roles of contributor, critic, and expert. For young people accustomed to that dynamic context, the traditional classroom can feel constrained. Online learning communities that include students, teachers, and professionals from different disciplines can provide a much richer, nuanced learning experience for all participants.

3

Flexible, self-paced learning.

Restructure the educational system to better accommodate diverse, individual learning styles and performance levels. Online educational materials allow for greater adaptability, as students can work at their own pace, alone or in collaboration with others, through individual exercises or entire curriculums.

CURRICULUM-DRIVEN TECHNOLOGY

Technology in education is about more than just finding ways to incorporate the newest digital tool into the classroom. Instead, the curriculum itself should be the focus driving the move to a more digital and mobile learning environment. Teachers—many of whom are digital natives themselves—have been at the forefront of the movement to use technology to augment curriculum; an even greater benefit would come from a more standardized approach, directed by school or district.

MANAGING THE CONNECTIONS.

THE DIGITAL DIVIDE STILL EXISTS IN THE U.S., BUT THE LOW ENTRY PRICE OF SMARTPHONES, COMBINED WITH THE BROADBAND INITIATIVES OF THE AMERICAN RECOVERY AND REINVESTMENT ACT OF 2009, IS HELPING TO CONNECT PEOPLE IN UNDERSERVED AREAS.

The challenge for schools is how to prioritize and manage investments in their own infrastructure so they are well-positioned to serve connected students. Most cash-strapped schools can't afford to update their hardware and applications at the pace at which technology is now evolving. In many cases, they lack the funding just to maintain current computing resources.

MOBILE LEARNING

ONE CONCRETE AND PRACTICAL STEP K-12 SCHOOLS CAN TAKE IS TO INVEST IN MOBILITY.

Mobile devices are less expensive than laptops, while still providing access to the Internet. Schools can provide students with 24x7 access and alleviate some of the financial burden associated with maintaining computer labs.

Research shows that mobilized learning, or “m-learning,” is particularly effective. Mobility enables “spaced” studying, in which students can access and record information and ideas over time, rather than “cramming” at a desk or laptop. The versatility of smartphone tools—camera, GPS, and browser—also allows for more imaginative lesson plans.¹

DATA MANAGEMENT: ENTER THE CLOUD.

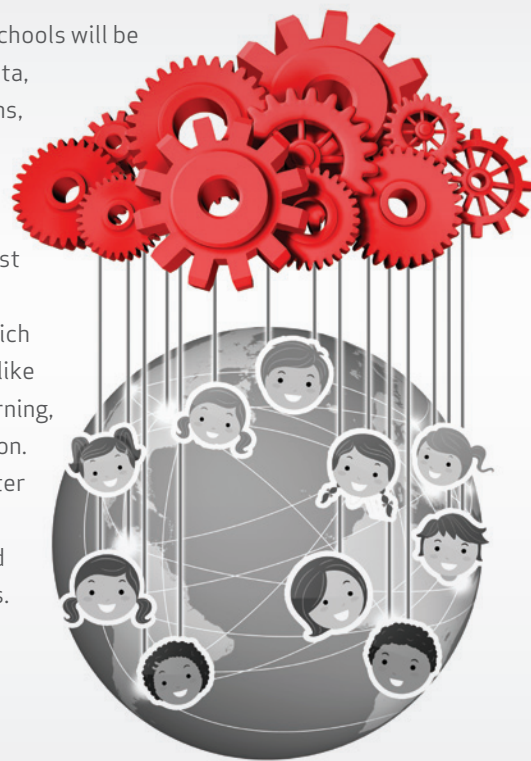
As more learning takes place online, a vast amount of data is generated by and about each individual learner. While this data is useful as part of a student's digital portfolio, these ever-expanding digital records create a new set of challenges for school districts—how to handle data management, preservation, and access.

MOBILE LEARNING PRESENTS BOTH POTENTIAL AND CHALLENGES FOR K-12 EDUCATION.



Even with rapidly declining costs of storage, most school districts cannot afford a secure and robust data-center infrastructure. And any solution that keeps student data siloed by district or school is counterproductive. Cloud-based data management is the solution here, allowing schools to scale their bandwidth and geographic reach without resource-intensive maintenance costs.

With cloud services, schools will be easily able to store data, textbooks, applications, and more, providing easy access and greater distribution. The cloud may also host learning management systems, software which can be used for tasks like record-keeping, e-learning, and online collaboration. This means both greater mobility and more directed, personalized learning opportunities.



STAYING **ON TRACK** WITH DIGITAL PORTFOLIOS.

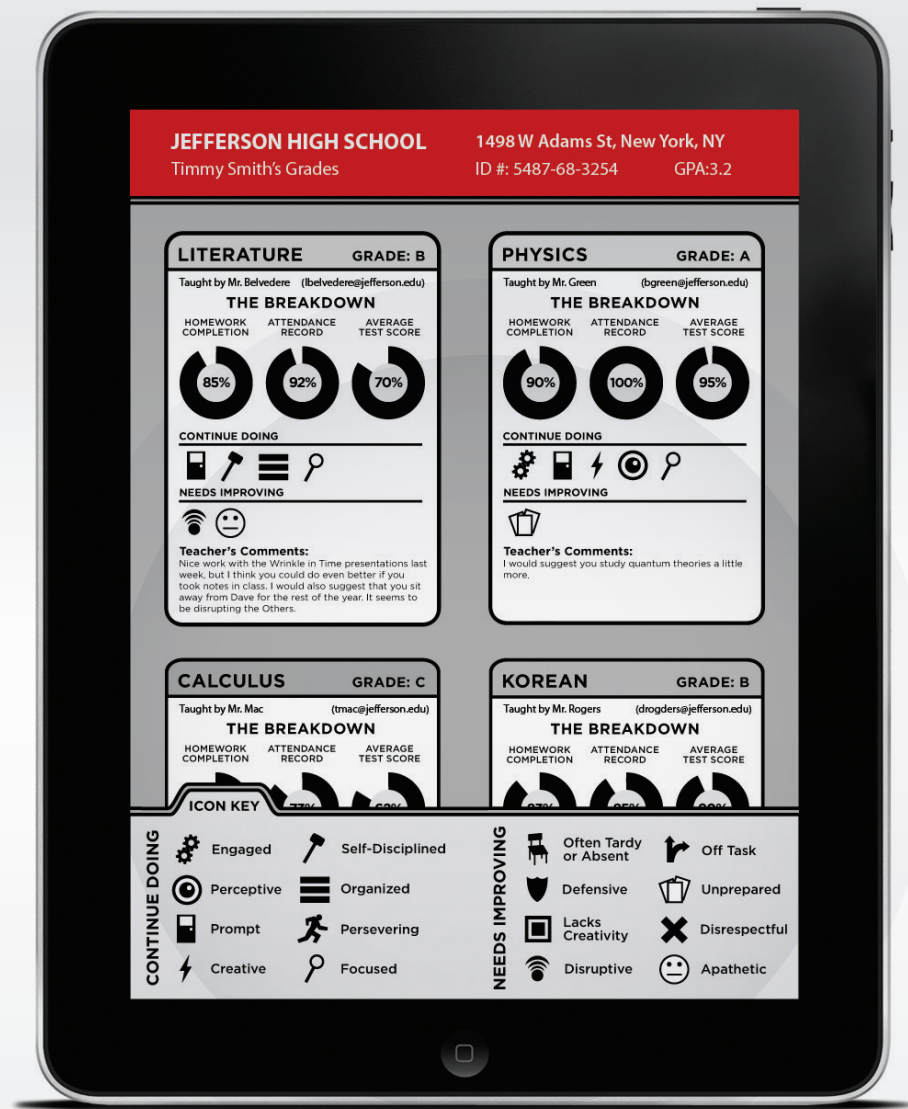
IF LEARNING IS NO LONGER LIMITED BY ONCE-TRADITIONAL CONSTRAINTS, HOW WILL EDUCATORS ENSURE THAT THEIR STUDENTS ARE MEETING A SET OF LEARNING OBJECTIVES?

One answer is digital portfolios. Each student's progress can be tracked with a digital profile that serves as a cumulative portfolio of their education, including their aptitudes and performance. Like any other electronic records (medical history, for example), these online portfolios would travel with students, and each of their instructors would be able to read and contribute to it.

Technologies already allow us ways to assess and provide immediate feedback on student performance, and, in some cases, to modify instructional prompts according to the student's performance. Consider the usefulness of such information collected over the course of their entire education, and how it could improve educators' ability to immediately adapt instruction for each individual student.

Now imagine that same ability to analyze student progress across different schools, districts, or states. The now-separate data stores from each different institution can be aggregated and shared with educators and decision makers at the state and federal levels, informing the direction and improvement of education at all levels.

KEEP TRACK OF STUDENT PROGRESS THROUGHOUT THEIR SCHOOLING, WITH A COMPREHENSIVE AND RESPONSIVE DIGITAL PORTFOLIO.



VIRTUAL SAFETY NET.

AS THE DIGITAL BORDERS OF LEARNING EXPAND, SO DO THE SECURITY RISKS. AND WHEN THE PRIVACY OF CHILDREN IS AT STAKE, SCHOOLS CAN'T AFFORD TO COMPROMISE.

To maintain public trust and meet rigorous compliance requirements, only authorized individuals should have access to the information for which they are approved. This requires a combination of carefully constructed policies and procedures, and daily monitoring at every layer of the network to protect institutional data, identities, and applications.

The open-source [Shibboleth System](#) holds promise for increasing the portability of student data. Shibboleth is an open-source project that provides single sign-on (SSO) capabilities and allows sites to make informed authorization decisions for individual access of protected online resources in a privacy-preserving manner.²



ADVANCING TO THE NEXT GRADE.

WE CAN NOW PROVIDE STUDENTS WITH LEARNING EXPERIENCES THAT TAKE PLACE BEYOND THE CLASSROOM AND ACROSS TIME ZONES.



More critically, we can deliver a highly adaptive and personalized education that enables learners to work in their own way, at their own pace, and in collaboration with an ever-changing network of peers, mentors, and educators.

To achieve these outcomes, schools must be prepared to make cultural, physical, and financial investments—investments in infrastructure, data management, and collaboration with other educational institutions, IT service providers, and data managers.

THINK FORWARD.

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1 Johns Hopkins University School of Education, *M-Learning: Promises, Perils, and Challenges for K-12 Education*.
2 EDUCAUSE Review Online, "Federated Security: The Shibboleth Approach"

