Microsoft

Transforming Learning Environments for Anytime, Anywhere Learning for All

Transformation Framework

Transforming Learning Environments for Anytime, Anywhere Learning for All

Introduction

This paper examines one of ten critical components of effective transformation in schools and education systems. Each paper is produced by an expert author, who presents a global perspective on their topic through current thinking and evidence from research and practice, as well as showcase examples. Together, the papers document the contributions of 'anytime, anywhere' approaches to K-12 learning and explore the potential of new technology for transforming learning outcomes for students and their communities.

Transforming Learning Environments for Anytime, Anywhere Learning for All

School transformation requires the co-operation of the entire community – educators, government and ministry leaders, students, faculty, private providers, social service organizations, religious leaders, parents, and more. In this light, Adaptive Anytime Anywhere Learning Communities (ALCs) should function as 'communities for innovation,' which collectively embrace innovation in all its guises and creative capacities. This requires using digital technologies as a collective community resource.

This paper explores how students and teachers adapt to these new technologies, how geographic communities play an integral role in their deployment, and how 'flipped communities' (student-centered communities) may serve as a catalyst for schools to create the best possible educational, social and cultural impacts for community development. We have moved beyond simply 'flipping' classrooms. ALCs are about enabling learning environments that support and drive entire 'flipped communities.'

What is the Education Transformation Framework?

The Microsoft Education Transformation Framework helps fast track system-wide transformation by summarizing decades of quality research. It includes a library of supporting materials for ten components of transformation, each underpinned by an executive summary and an academic whitepaper detailing global evidence. This provides a short-cut to best practice, speeding up transformation and avoiding the mistakes of the past. Microsoft also offers technology architectures and collaborative workshops to suit your needs.

About the author

Dr. Don Olcott, Jr.
FRSA Professor of Educational Leadership and Open and Distance Learning
University of Maryland University College, United States

Dr. Don Olcott, Jr. is President of HJ Global Associates focusing on open and distance learning, global higher education, and educational leadership. Dr. Olcott holds an appointment as adjunct full Professor in the Faculty of The Professions at the University of New England in Australia and a Research Associate with Nova Southeastern University (USA). He currently serves on the USDLA Board of Directors and is a Fellow of the Royal Society for the Arts (FRSA).

Entering the connected world

The 21st century student must learn how to 'connect' isolated pieces of information, with the guidance of 21st century teachers who can demonstrate collection, orchestration, remixing, integration and knowledge building.

What does connectivity look like?

Today, digital technology provides ubiquitous and instantaneous access to unlimited information resources, completely transforming schools and the educative process. At the same time, there is an increasing realization that information is not synonymous with knowledge – and access to this infinite virtual repository is only as valuable as one's capacity to assess, analyze, decipher, disaggregate, and apply knowledge in practical, real-world situations.[1]

The 21st century student must learn how to 'connect' these isolated pieces of information with the guidance of 21st century teachers who can show the student the art of 'collection, orchestration, remixing and integration of data into knowledge building'.[2] Knowledge building will also depend on students thinking about their own metacognition and reflecting on how they learn best.

Learning is about making connections. A range of teaching-learning connections permeate the teaching and learning environment – a learning space that can be physical or virtual. We connect new knowledge to existing knowledge; we connect the digital world with the real world; we connect students to content, students to students, and students to teachers. We connect the learning space to the world, competencies to skills, individuals to groups, and groups to communities. And, most importantly, we connect technology to information – information to knowledge and knowledge to application in the real world. We connect students to life.[3]

How do we get there?

This paper explores innovative new learning environments, seeks out new digital applications among teachers and students, and helps define 21st century smart learning environments that are increasingly mobile and cloud based. This is a formidable challenge for education systems and institutions all over the world. It requires us to think differently about how we think, how we teach, and how we learn; and to resist a fundamental tendency of human nature – to retreat to the status quo where we feel comfortable and safe from ambiguity and the unknown.

The goal of ALCs is to create a 'community for innovation' rather than a 'culture of technology'.

Adaptive Anytime Anywhere Learning Communities (ALCs) look at digital learning through a broader lens than personal or digital learning environments.

Digital technologies are not simply for use in the schools by teachers and students; nor simply a showcase for Open House and parent briefings on an ad hoc basis. They are a collective community resource. ALCs explore how students and teachers adapt to these new innovations, how geographic communities play an integral role in the deployment of these innovations, and how 'flipped communities' may serve as a catalyst for schools to leverage outputs by assuming new roles to create optimum educational, social and cultural impacts for community development.

1 Cavanaugh, McCarthy & East, 2014; EDUCAUSE, 2009.
2 EDUCAUSE, 2009, p. 2.
3 Olcott, 2014.

The term adaptive learning has been applied to adapting technology to meet individual student learning needs. This approach is consistent with student expectations that experiences, services and products can be aligned with their individual learning needs and preferences.[4] Conversely, we must broaden the dialogue to explore how individuals and communities can adapt to digital technologies.

The paper will provide a brief synopsis of learning theory, personalized learning environments, mobile digital devices, and cloud based digital learning spaces as a gateway to the concept of ALCs. We will also look at the 7Es of ALCs – engage, experience, empower, effect, emote, evolve, and efficacy – and how these elements provide a roadmap for creating ALCs that are reciprocally transformative across the broader community landscape.

Making connections is the key to redefining the school-community dynamic for the 21st century. The goal of ALCs is to create a 'community for innovation' rather than a 'culture of technology'.[5]

What is an effective school?

Of course, the answer to this question depends on who is asked, the context which the question is posed, and the role and values of the person giving the answer. After all, where one stands is often influenced by where one sits.

However, Cavanaugh, Repetto & Wayer have identified the 5Cs of effective schools. These included: 'caring communities, where students have control, quality curriculum, connection the future and the world beyond the classroom, and a supportive climate'.[6]

Digital innovations play a major role for all of the 5Cs. The key is for digital technologies to be on all stages for all stakeholders, rather than centerstage as a panacea for school transformation. Before we can look at the ALC environment we must briefly highlight how these innovations are being used inside the schools.

Definition:
Adaptive Anytime Anywhere Learning Communities (ALCs)

The use of digital technologies to transform schools through personal and community learning environments, which ultimately builds a 'community for innovation' that connects all stakeholders to a common action agenda.

Effective schools include caring communities, where students have control, quality curriculum, connection the future and the world beyond the classroom, and a supportive climate.

4 Boyd, 2014.
5 Olcott, 2014.
6 Cavanaugh, Repetto & Wayer, 2013, p. 4.

What can theory tell us about technology?

Learning theory

A few years ago futurists attempted to mesmerize us with enlightened sound bites like half of the knowledge an engineering student learns is obsolete by the time the student graduates from college. A professional colleague reminded me, however, that even if this were true the fundamentals of sound engineering do not change; a 'teachable moment' and indeed an important lesson for school leaders and policy makers as they soar off on a new journey into digital learning.

The changing role of teacher from didactic maestro to knowledge facilitator suggests that digital innovations can help all teachers become better 21st century teachers.

Good teaching is good teaching – effective learning is effective learning. The influx of 21st century digital technologies does not change this anymore than they alter the sound tenets of proven learning theories. What digital technologies actually do is leverage our capacity to create new learning designs to apply the basic concepts and constructs of sound learning theory that result in improved performance by students. Do these digital innovations have the power to make average teachers master teachers? Perhaps not directly because the human dynamic of teaching that makes it an art rather than a science remains alive and well. At the same time, it is prudent to remember that the changing role of teacher from didactic maestro to knowledge facilitator suggests that digital innovations can help all teachers become better 21st century teachers.

Cognitive adaptation

Learning is about making connections and learning theories help us conceptualize these connections in cognitive, behavioral, and affective domains that allow us to collectively relate to the physical world. Piaget's theory of Cognitive Adaptation provides a cognitive roadmap for how we all connect one of the most essential building blocks of learning: Experience.[7]

Piaget's theory suggests that through our cognitive schemes, we either assimilate new knowledge with existing knowledge due to logical connections; or we change our cognitive schemes to accommodate new knowledge that does not fit with our pre-existing mental schemes. A scheme is a basic set of experiences and knowledge gained through experience that tells us how things should be and act in the person's environment. As adults, this makes sense; however, for school-age children the dynamics are more complex because their experience level is low and from early childhood through early adulthood there is a progression of cognitive development stages occurring.

Without oversimplifying Piaget's stages, the school age period covers the pre-operational, concrete operational, and formal operational stages – roughly ages 2-18. During the pre-operational stage children think primarily egocentrically as they learn to use language and represent objects by images and words, including recognizing the difference between an object image and the real object. For example, a child may see a dog on television and yet be able to distinguish a real dog running across the street.

At the concrete operational stage (ages 7-11), children begin to think logically about objects and events. Children begin to classify objects according to several features and/or along a single dimension (size, color, etc.). Finally, in the formal operational stage (ages 11 and up), teenagers begin to think logically and abstractly.

The use of digital innovations, even with young children, can be used in cognitively-aligned ways to facilitate learning consistent with the child's cognitive developmental capacities.

These developmental stages are important for two reasons. First, experience is cumulative and a child's experiential repository increases as the child progresses through the cognitive stages. As the child develops, he or she learns how to assimilate or accommodate new knowledge.

Secondly, and most importantly for our discussion, the use of digital innovations even with children as young as 5 or 6 can be used in cognitively aligned ways to facilitate learning that is consistent with the child's cognitive developmental capacities. A child can visualize objects on a computer screen and then identify real objects in the school environment. A child in the concrete operational stage can logically deduce if thunder is heard, lightning will soon follow – they can confirm this by searching for the concepts on a computer. And on a rainy and dreary day, the formal operational stage suggests that the child can visualize an abstract mental picture of his or her physical environment that is sunny, clear with beautiful blue skies even though the physical environment does not concur.

It is beyond the scope of this paper to delve into a comprehensive discussion of other learning theories. The Piagetian discussion was presented to demonstrate the contribution of digital technologies to education in alignment with learning theory and teaching strategies attuned with the developmental stages of children. Howard Gardner's theory of multiple intelligences has similar applicability.[8]

Gardner argues that there are least seven intelligences – interpersonal, intra-personal, existential, spatial, mathematical, naturalistic, and musical. He suggests that these can be developed in each individual based on natural abilities as well as motivation and other external factors 'connected' with learning. James Gibson expanded our understanding of perception, visualization and the affordances associated with objects.[9] Digital innovations are tools that can help us design learning in ways that recognize these multiple intelligences as well as teach developmentally appropriate strategies about the theory of affordances.

Constructivism

Vygotsky formulated his social development theory which forms one of the foundations of constructivism.[10] He argues that social interaction comes before development and that cognition is the accumulation of socialization and social behavior. In essence, the learner is an active constructor of knowledge and experience – constructivism. Like Piaget, Vygotsky suggests new information is linked to prior knowledge and he expands this to suggest that the learner constructs knowledge based on personal experiences and hypotheses of the environment, testing hypotheses through social negotiation.

Constructivism argues that all knowledge is constructed from the learner's previous knowledge, regardless of how one is taught. This reflects an important misunderstanding that teacher's should never tell student anything directly and let them construct their own knowledge base. This confuses a theory of pedagogy (teaching) with a theory of knowing (constructivism). In practical terms, constructivism suggests that people learn from mediators – parents, instructors, peers, and even digital applications.[11]

Constructivism suggests that people learn from mediators – parents, instructors, peers, and even digital applications.

Connectivism

A related theory to constructivism is connectivism. Siemens suggests that connectivism is a learning theory comprised of different series of nodes to connect hundreds of networks to facilitate synchronous and asynchronous learning.[12] Moreover, according to the principles of connectivism, people acquire information through three main sources in the modern age: 1) online classrooms and MOOCs; 2) social networks including podcasts and video clips; and 3) virtual reality platforms. Indeed, this is arguable from a learning theory perspective.

It should also be noted that connectivism has been criticized as being a quasi-learning theory if at all. Bell referred to connectivism as an instructional theory, not a learning theory; and in fact connectivism is derived from learning theory.[13] Regardless of this definitional debate, connectivism brings modern learning sources to the forefront of the discussion about effective learning and should be given more than a cursory review and assessment.

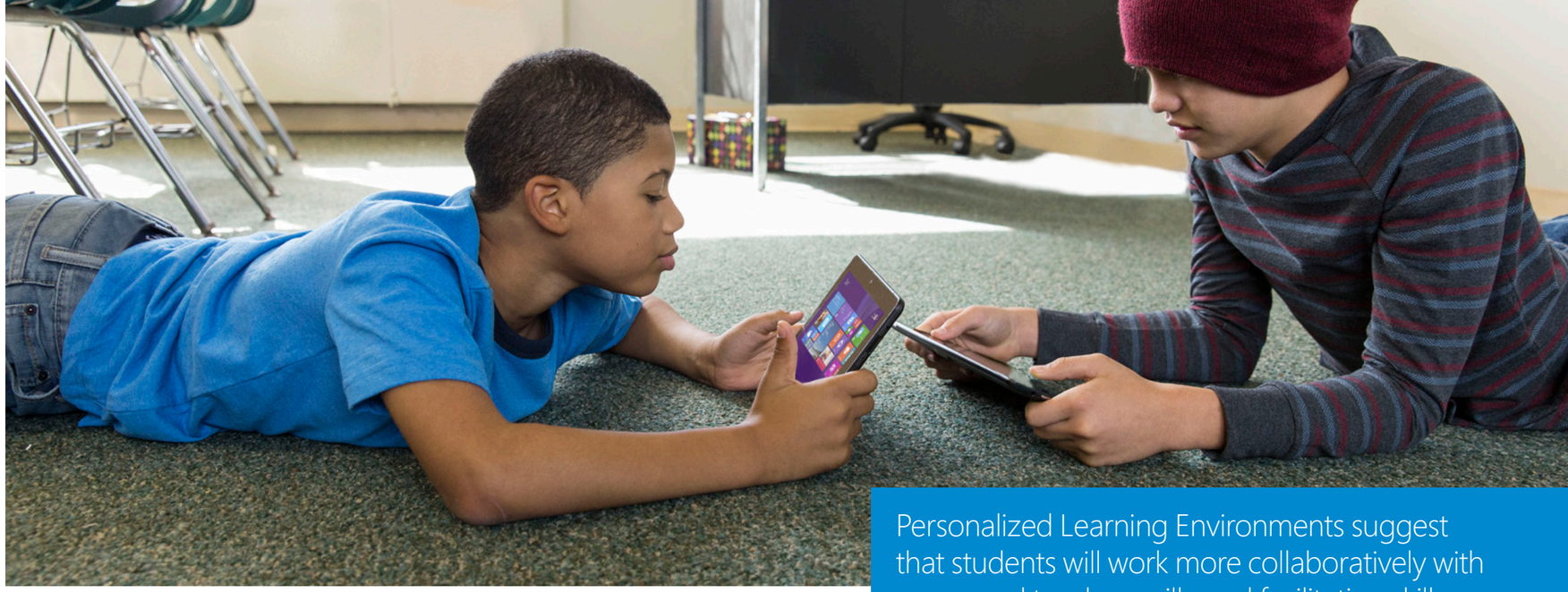
If learning is observable, it is measurable, and authentic assessment of performance can employ valid metrics for measuring observable learning gains.

A final point on learning theory relative to all education. 'The primary evidence of learning is an individual's change in performance.'[14] The relevance of this statement is multi-faceted and is reflected in numerous manifestations of 21st century learning – competency-based learning, digital design, assessment practices, qualitative research methods, and more. It is also a subtle reminder that the learning theory of behaviorism[15] still lingers in the hallways and classrooms of the modern school.[16] In sum, if learning is observable, it is measurable and authentic assessment of performance can employ valid metrics for measuring observable learning gains.

7 Piaget & Inhelder, 1973; Satterly, 1987; Wood, 1998; Bee & Boyd, 2004.

8 Howard Gardner, 1983.
9 James Gibson, 1950, 1979.
10 Vygotsky, 1978.
11 Wertsch, 2008.
12 Siemens, 2008; Dunaway, 2011.
13 Bell, 2010.
14 Driscoll, 2005; Gould, 2008.
15 Skinner & Thorndike.
16 Gould, 2008.

Types of 'Anywhere, Anytime' learning



Personalized Learning Environments suggest that students will work more collaboratively with peers, and teachers will need facilitation skills.

Personalized Learning Environments

Personalized Learning Environments (PLEs) describe 'the tools, communities and services that constitute the individual educational platforms learners use to direct their own learning and pursue educational goals'.[17] PLEs are learner-centric contrasted with the learning management system (LMS) which is course-centric. In a practical context, PLEs are the cumulative repository of learning resources that a student taps for his or her own learning – blogs, OERs, social media sites, on-line learning communities, and others. Moreover, PLEs are essentially interactive, problem solving tools that begin to direct a student towards reflection on his/her metacognition (individual learning style), and also by combining the input and reflections of others in the aggregate learning process.[18]

Why are PLEs important for our discussion? In concert with digital innovations, PLEs put the learner in charge of his/her own learning – in one sense an extension of the individual research model. As students begin to examine their own metacognition, they begin to decipher what tools, resources and knowledge help them learn best. The obvious connections to digital innovations are the connections afforded learners to access information and knowledge sources for their own learning. PLEs suggest that in the future students will work more collaboratively with peers; teachers will need facilitation skills to direct students to credible sources; and ultimately students will learn to analyze, synthesize and apply valid and reliable knowledge from these sources and throw out the 'noise' or 'junk knowledge'.[19]

The future of mobile technologies is to serve as the supporting cast for supplementing formalized instruction.

Mobile learning

Smart phones, tablets, and other digital devices first and foremost provide access to information and access to people.[20] In one sense, mobile technologies are already playing a significant role in 'connecting' students to the world. Conversely, having a smart phone in one's hand is not synonymous with engaging in formal educational instruction. Perhaps the future of mobile technologies is to serve as the supporting cast for supplementing formalized instruction whether face to face or online by giving students instantaneous access to knowledge sources right at their fingertips.

Learning environments: from classrooms to learning spaces

In the digital world, teaching and learning can occur anywhere, anytime, at any pace, and supported by a broad range of digital tools. This suggests that the 21st century school must create a learning environment of creative learning spaces – real and virtual that can accommodate simulations, role-laying, collaborative research, and networking.[21]

The collaborative nature of learning suggests that learning theory, PLEs, and mobile learning devices all contribute to connecting teachers and student with knowledge and experience repositories. Learning tends to be deepest and most effective with interaction and guidance particularly when using the content and tools associated with digital technologies[22] together with learning spaces. Guernsey highlights "findings from developmental science have led to greater understanding of how children's learning environments can shape their growth; higher expectations for children's cognitive and social development; and higher standards for educators and caregivers."[23] Schools must build more 'Learning Spaces' to include virtual and physical learning areas, to facilitate on-going collaborative learning in the schools and in the broader community.

Six possible roles for teachers in a Personalized Learning Environment

1. **Facilitator** – Directing students to credible and valid knowledge sources.
2. **Remediator** – Helping students who fail to achieve learning objectives by intervening with alternative learning strategies.
3. **Enricher** – Helping students take basic knowledge and convert it to applied knowledge in authentic ways.
4. **Collaborator/Mentor** – Actually working side by side with students in deep exploration of the PLE universe.
5. **Curator** – By managing open educational resources and other open content, the teacher will expand curriculum development opportunities aligned with student needs.
6. **Obsolete** – A doubtful but clear lesson to ensure educators focus on effective teaching and learning, rather than placing technology at the forefront of the educational enterprise.

Thornburg's Campfires in Cyberspace

The Campfire – A learning space to allow storytelling. An opportunity to learn from experts, a lecture theatre, and a formal classroom is an example of this space.

The Watering Hole – Less formal, where learners can become teachers or teachers become learners. A place to share ideas, to listen, to collaborate, to communicate or simply to reflect in the company of others. This could be in a common room, the school library or an online community.

The Cave – "Where we came in contact with ourselves."[24] Comfortable common rooms and libraries or online digital portfolios that allow for personal reflection. Whilst providing opportunities for students, "the 21st century requires greater connection between educators to learn from each other and share resources."

Life – Some way to see the "application of knowledge."[25] This could be an assignment, such as a digital book or podcast shared publicly, or a presentation or activity at the Campfire, school assembly or sporting venue. As Thornburg indicates, "when we learn something in anticipation of its immediate use, we not only reinforce our understanding, we increase the likelihood that what we have learned will not be readily forgotten."

17 EDUCAUSE, 2009, p. 1.
18 American Institutes for Research, 2012; EDUCAUSE, 2009.
19 Vygotsky, 1978.
20 Cavanaugh, McCarthy & East, 2014.
21 Oblinger, 2005.
22 Jonassen, 2012.
23 Guernsey, 2014, p. 3.
24 Ibid, p. 3.
25 Ibid, p. 9.

A Smart Learning Classroom

Traditional classrooms are, in most cases, built for a "stand-and-deliver" mode of learning where teachers serve the role of "depositors" of knowledge and students as the "depositories" of knowledge.[26] Moreover, traditional classrooms have inflexible layouts and furniture that makes collaboration, working in teams, and space for experimentation more difficult. Also, technology is not easily accessible and is usually confined to a computer, overhead projector, and display system. Nonetheless, more school systems are investing in mobile devices and cloud computing to help the learning environment become more flexible. A Smart Learning Classroom (SLC) has traditionally been defined as an enhanced classroom that cultivates opportunities for teaching and learning through the use of technology.

However, technology is just one aspect of a SLC and there are many other factors to consider when implementing a SLC. As a start, educators should consider updated and emerging strategies for teaching and learning that facilitate a SLC. One strategy is a personalized learning environment that allows students better ownership of their learning pathways and provides teachers a more robust set of artifacts they can use to assess how the learning is getting on. By using a personalized learning environment, a SLC becomes more akin to an Anytime Anywhere Learning Community.

Guidance on Learning Spaces and skills required in the 21st century[27]

Personal digital spaces	Digital repository with all personal learning materials, going back and forth without losing track, accessible anywhere, anytime (e.g. Yammer with Office365) • Basic computer and networking skills to build, maintain and expand a personal digital repository (throughout the life) • Information evaluation and management skills	**Connecting and social spaces**	Physical and virtual, connecting spaces where all the actors involved in learning meet (e.g. Office365 with One Note, Skype, Yammer or SharePoint) • Norms and values of online communication, identity management • Collaboration and networking skills (also in real life)
Trusted spaces	Trust, confidence and reliability of resources and people (e.g. Skype, Windows Store) • Privacy and security, IPR and copyright skills • Trust, confidence and reliability of resources and people (e.g. reputation systems)	**Motivating and emotional spaces**	Enhancing and improving the experience, inviting to learn (e.g. Second Life, YouTube) • Sharing of personal information and learning, openness to others • Skills to personalize one's own learning, to know one's objectives • Skills to find and use new tools, e.g. videos, virtual worlds (learners and teachers)
Learning spaces	Differentiating between time to learn or to do other things • Self-management skills for differentiating time for learning • Skills to differentiate between time to learn or to do other things • Self-management skills in terms of timing and concentration	**Creative/ flexible spaces**	Combining learning modes and styles according to the situation (e.g. Livemocha, Office Sway) • Learning to learn skills, selection of one's best learning style • Skills of teachers and organizations to support different ways for learning
Open and reflexive space	Giving space for thinking, enabling to plug-in again, allowing others to comment, review, suggest… (e.g. Office365 blogs, wikis) • Skills to reflect, be open, expect and accept feedback and critique	**Certified space**	Facilitating evaluations and assessments, accreditations for achievements (e.g. ePortfolios in Office365 and OneDrive) • Self and knowledge presenting skills (e.g. e-portfolio) • Organizational learning to acknowledge skills acquired in alternative ways
Professional learning spaces	Sharing and managing knowledge and resources at work and by organizations • Skills of the organizations to develop facilities and practices to share and manage knowledge and resources between all users • Skills to work and share collaboratively in professional environment	**Inclusive spaces**	Supporting access to learning equally for everyone, compensating possible disadvantages and handicaps (e.g. Windows)

Case Study:

Example of a Smart Learning Classroom from the perspective of a student

Carrie Oakey is learning about the area of polygons. Before coming to class, her teacher created some video vignettes, using tools like Office Mix, and added some useful resources to the classroom's shared OneNote folder. Carrie was able to view the videos and look through some of the resources before coming to class; however, she has some questions regarding the content.

When she walks into class, there are several stations the teacher has set up: a review station where the teacher is using an interactive display, a peer-review station where clusters of students are working through problems together, and a "move beyond" station where students work with manipulatives, probes, sensors and other tools in a playground-type environment.

The review station has an interactive display that allows teachers and students to manipulate objects on a large-surface using multi-touch/pen. The display also uses software, like Promethean's ClassFlow, to send content from the display to student devices allowing them to manipulate, annotate, and create assets using a digital pen that can then be shared with the group. As the teacher asks for feedback, the software is able to save individual student responses that can be accessed by the teacher at any time. The teacher, in this case, serves as a guide to help students better understand the concept of area and how it relates to different polygons.

Carrie decides that she understands the basic concepts, but needs to check her understanding by having some dialogue with a few of her peers. She decides to join-in on the peer-review station. Here, students work with one another to solve problems related to the main objectives from the lesson. They have access to different content resources that allow them to practice different problems and access to different tools, like FluidMath, that make it easier to explain mathematical concepts to one another. As students complete different problem tasks, they are able to track their solutions and competency skills in the system and this information can be accessed anytime, anywhere by the teacher, student, or parent.

As Carrie's peers helped answer some of her questions, she moves on to the "move beyond" station where she has set up some time to connect with her "math pal" at the local primary school (a primary student Carrie is working with to teach her basic math skills). She connects with her math pal via Skype and uses a shared OneNote notebook to show her math pal some new math concepts. Carrie then reflects on her experiences in her shared OneNote journal with her teacher and class peers.

Getting it right

The 7Es of Adaptive Anytime Anywhere Learning Communities

Adaptive Anytime Anywhere Learning Communities (ALCs) take our previous discussion about learning theory, PLEs, mobile technologies, and expanding real-virtual learning spaces to a broader community context. ALCs 'connect' all stakeholders in the community rather than just students and teachers. Parents, business leaders, community representatives, government agencies – the entire community is engaged in building one mega-learning space across the community for formal learning – but also for the collaborative linkages to address community development in all its guises.

Today, thriving cities worldwide are transforming their education systems as well as their infrastructure. From providing better access to resources through new services and connectivity, to programs that promote innovation and nurture talent, Microsoft CityNext is helping students prepare for the 21st century by expanding skills through digital inclusion.

Microsoft Corporation, 2014

Engage

Ensure the active engagement and digital inclusion of all

Universities are often viewed as ivory towers, insular and protected from outside influences. Public schools also have this tendency to keep the broader community at a distance. When do parents come to schools? They come for open houses, parent conferences, and perhaps ad hoc events when the school or region needs a levy or financial initiative passed. ALCs are predicated on active engagement, and parents would be in schools every day. Teachers would do their own internships in local business to align content with real world skills. Community groups would use school facilities to promote community action events and initiatives. And, all of these activities would be supported by digital innovations to make and sustain these 'connections.' Schools must do a better job of inviting everyone in to the classroom. With global youth unemployment expected to be 21.9% in 2017, a global initiative from Microsoft, CityNext, helps cities and schools drive their communities to take advantage of existing resources to build a sustainable model of innovation.[28]

Experience

Leverage the invaluable repository of collective experience

Experience is cumulative. Students, teachers, parents, counselors, business leaders, government personnel, social service agencies all bring extensive experience to the community. In essence, the community is its own mega-repository of knowledge and strategies for the community. This is an infinite resource for all member of the community. ALCs recognize this invaluable repository for empowering communities to empower schools and personalized learning across the community. Moreover this experiential repository is reciprocal – it can be exchanged and re-distributed among all stakeholder groups in the community. Communities for 21st century schools must tap this experience repository – for formal education and for community development.

Empower

Engage the entire community in innovative thinking

The core foundation of building ALCs is to create a 'community for innovation'.[29] Innovation is not synonymous with technology. Innovation, in fact, exists along a continuum that includes much more than just hardware and software.[30] Innovation is thinking and creativity. Innovation is new policies, processes, procedures, curriculum, pedagogical practices and more. Moreover, using by-lines such as building a 'culture of innovation' or a 'culture of technology' is not only doublespeak – it is misleading to students, learners, and other stakeholders. ALCs are predicated on engaging the entire community in innovative ways of thinking – about everything, not simply technology.

Effect

Commit to continuous quality improvement

Similar to experience, effects from learning are cumulative. The community repository of experience must be supplemented with evidence and data that demonstrate precision effects – effects of teaching on learning; effects of digital technologies and PLEs on metacognition of learners; effects of schools on community action initiatives; effects of business partnerships with schools; effects of parent engagement by active participation (not simply coming to Open House) in the educative process. Moreover, decision making at all levels, from the classroom to the mayor's office to the corporate CEO's beach house, must be embedded in a commitment to continuous quality improvement through performance based management – using data to make good decisions.[31]

Emote

Encourage the expression of emotions and beliefs

ALCs presume that the affective domain – the open and honest expression of emotions in the education process (teaching and learning) are as valuable as intellectual gains by students. Schools must engage students in the emotional context of being students, peers, citizens, and adaptive learners through the digital resources of the 21st century. Emotional health is an area that tends to be overlooked unless there is a problem – healthy expression of emotions, views, values, attitudes, and belief structures are an essential part of the educational process.

Evolve

Prepare students for tomorrow's world

Transformation is evolutionary rather than revolutionary. ALCs suggest that transforming schools takes creativity, re-assessment of traditional practices and approaches, a 'community for innovation,' collaboration, and the recognition that we are not preparing students for today's world – we are preparing students (and ourselves) for the 2030 world. We not only need to think outside the box – we need to take the risks to think that the box doesn't exist. The author was once asked who invented the mobile phone – this was in front of 500 people. I answered Gene Roddenberry. The woman who asked the question did not understand. I explained that the first mobile phone that I saw was Captain Kirk talking to Scotty aboard the U.S.S. Enterprise: 'Beam me up Scotty.' There were no cellular phones when Star Trek hit the airwaves in the mid-1960s but they did exist in the imaginations of people and creators.

Efficacy

Tap into the creativity of your entire community

Ask any principal, CEO, university president, government leader or other leader this question: How do you reward your employees for failure? Most will escort you to the door without a return invitation. The rhetoric of innovation, imagination, creativity are politically correct sound bites – but actually engaging people in the creative process without adding the punitive or retributive consequences takes real leadership and visionary capacity to see the forest through the trees. Does this mean every organization just lets people spend away the organization by trying every creative and innovative idea that pops up? No. What it does mean, however, is creating a 'community for innovation' where great ideas, great applications, and yes, great technologies can be created in a 'community for innovation' that taps the unlimited creative spirit across the community. How many great ideas and practices do we lose every day in business, government and education because people fear negative consequences for their creative talents?

28 Microsoft Corporation, 2014.
29 Olcott, 2014.
30 Rogers, 2003.
31 Bennis & Nanus, 1985; Burns, 2010; Hickman, 2010; Yukl, 2013.

Developing your own change strategy

Guiding questions for transforming learning environments

- How will Learning Spaces be redesigned to enable 21st century learning?
- How does access to technology impact decision making and design of spaces?
- What does a smart classroom look like? What does it "feel" like?
- How do the devices prepare students for their next steps in learning and life?
- What technologies do teachers require in classroom, the school grounds, at home, on camp?
- What are the implications of curriculum design to make effective use of 1:1 learning and new learning spaces?
- What training is needed for teachers?
- What administration systems are needed to provide Personalized Learning systems and environments?
- What internal and external communication systems are required to enable 24/7 anytime, anywhere collaboration?
- What Content Management and Distribution systems are required to enable 24/7 anytime, anywhere collaboration?
- What implications occur on student data management and Personalized Learning systems in 21st century learning environments?
- What safety, security, and privacy of people, property and data is needed?
- What support is needed to support such environments?

Technologies schools can use to support change

Anywhere, Anytime learning is inherently digital, so there are many ways schools are using technology:

- Schools are analyzing terabytes of student data using Microsoft Big Data and Business Intelligence, to develop new student-centered tools and applications.
- Youth programs like Microsoft Dreamspark, YouthSpark and Imagine Cup support student collaboration, competition, and innovation.
- Skype in the Classroom lets students connect to experts, experiences and peers across the globe.
- Mobile learning is being supported by Office on Mobile Devices, Windows InTune for Cloud-based Mobile Device Management and Windows featured PCs.
- Schools are providing ubiquitous access services and resources using Direct Access in Windows and Enterprise Mobility Suite.

References

Bee, H., & Boyd, D. (2004). The developing child (10th ed.). Boston: Pearson.

Bell, F. (2010). Connectivism: Its place in theory-informed research and innovation in technology-enabled learning. In the International Review of Research in Open and Distance Learning, 12, (3): 98-118.

Bennis, W. and Nanus, B., (1985), Leaders: The Strategies for Taking Charge, Harper and Row.

Boyd, D. (2014). It's complicated. Princeton, NJ: Yale University Press.

Burns, J. M (2010). Leadership (Excerpts). In Gill Robinson Hickman (Ed.) Leading organizations Perspectives for a new era (pp. 66-75). Thousand Oaks, CA: Sage Publications.

Cavanaugh, C., McCarthy, A., & East, M. (2014). An innovation framework for holistic school transformation: Ten critical conversations for the 21st century. Seattle, WA: Microsoft.

Cavanaugh, C., Repetto, J. & Wayer, N. (2013). Online Learning for Students with Disabilities: A Framework for Success. Journal of Special Education Technology 28(1). 1-8.

Driscoll, M. P. (2005). Psychology of learning for instruction (3rd ed.). Boston: Pearson.

EDUCAUSE Learning Initiative. (2009). 7 things you should know about ... Personal Learning Environments. EDUCAUSE.

Gardner, H. (1983). Frames of mind: The theory of multiple intelligences. London: Fontana Press.

Gibson, J. J. (1950). The perception of the visual world. Boston. Houghton Mifflin.

Gibson, J. J. (19790. The ecological approach to visual perception. Boston: Houghton Mifflin.

Gould, M. (2008). The learning process. Learning Process – Research Starters Education.

Guernsey, L. (2014). Envisioning a Digital Age Architecture for Early Education, New America Foundation. New York. Retrieved from: http://www.newamerica.net/sites/newamerica.net/files/policydocs/DigitalArchitecture-20140326.pdf

Freire, Paulo. (1993). Pedagogy of the oppressed. New rev. 20th-Anniversary ed. New York: Continuum.

Hickman, G. R. (Ed.). (2010). Leading organizations: Perspectives for a new era (2nd Ed.). Thousand Oaks, CA: Sage Publications.

Jonassen, D. (2012). Meaningful learning with technology. Upper Saddle River, NJ: Allyn & Bacon.

Marquis, J. (2012). 6 possible roles for teachers in a personalized learning environment. Teach thought Staff. (http://www.teachthought.com/author/teachthoughtstaff/)

Microsoft Corporation, Microsoft CityNext, Retrieved from: http://www.microsoft.com/government/ww/public-services/city-next/Pages/education.aspx

Oblinger, D. (2005). Leading the transition from classrooms to learning spaces. Educause Quarterly, 28, (1): 14-18.

Olcott, D. J. (2014). (In-Press). Building digital bridges to the future: A primer for ministry leaders for school transformation via public & private educational partnerships. Microsoft Worldwide Education White Paper Series. Seattle: Microsoft.

Olcott, D. J. (1997). Where are you George Orwell? We got the year ... missed the message. Open Praxis,2, 22-24.

Piaget, J., & Inhelder, B. (1973). Memory and intelligence. London: Routledge and Kegan Paul.

Punie, Y., & Ala-Mutka, K. (2008), Learning Spaces: Opportunities and challenges for future Learning Environments, IPTS Information Society Unit, JRC European Commission. Retrieved from: http://is.jrc.ec.europa.eu/pages/EAP/documents/2007Learning_SpacesDigitalLiteracy_000.pdf

Rogers, E. M. (2003) Diffusion of innovations (5th ed.). New York: Free Press.

Satterly, D. (1987). Piaget and education. In R. L. Gregory (Ed.) The Oxford Companion to the Mind Oxford. Oxford: Oxford University Press.

Tanenbaum, C., Le Flock, K., Boyle, A., & Laine, S. (2012). Are personalized learning environments the next wave of K-12 education reform? American Institutes for Research.

Thornburg, D. (2007). Campfires in Cyberspace: Primordial Metaphors for Learning in the 21st Century. Retrieved from http://tcpd.org/Thornburg/Books/Campfires.html

Vygotsky, L. S. (1978). Mind and society: The development of higher mental processes. Cambridge, MA: Harvard University Press.

Microsoft

Interested in taking the next step on your transformation journey?

Visit **microsoft.com/education/leaders**