Association of California School Administrators
TECHNOLOGY LEADERSHIP GROUP POSITION PAPER

"Everywhere we look, there is work to be done. The state of the economy calls for action, bold and swift, and we will act – not only to create new jobs, but to lay a new foundation for growth…we will transform our schools and colleges and universities to meet the demands of a new age. All this we can do. And all this we will do."

President Barack Obama
Inaugural Speech of 20 January, 2009 (The White House, 2009)

Purpose

To provide recommendations for educational leaders to strategically and urgently promote effective, integrated technology into the teaching and learning experience for the benefit of all students.

Rationale

There is an increasing gap between the networked, information-rich global society outside of schools and the pervasive forms of instruction in public education classrooms. *To better prepare our students for the changing world this paper will provide examples and justification for strategies that should be implemented.*

Recommendations for Teachers

- Permit and promote collaborative student projects in conjunction with individual measures of achievement.
- Include meaningful feedback on challenge-based learning experiences as part of the assessment and accountability system.
- Engage students as active directors of learning, guided by the teacher, and utilizing the vast array of reference materials and social networking opportunities to answer essential questions and solve real problems.

Recommendations for Site Leaders

- Provide resources and training to assist teachers in implementing and facilitating challenge-based learning experiences for all students.
- Provide resources and training to accelerate the shift to customized learning experiences to promote flow learning and develop adaptive expertise.
- Support key site-based initiatives and promote exemplars which integrate technology applications into the standards-based curricula.

Recommendations for District Leaders

- Revisit the concept of age-based grouping and deploy several alternatives to this approach to guide schools in optimal grouping arrangements.
- Permit and promote new tools for communication and service such as blogs, wikis, webinars, SMS, RSS feeds, etc.
- Expand instructional resources and support to ensure that all students have access to online digital tools at school and in their homes.
- Include meaningful feedback on challenge-based learning experiences as part of the assessment and accountability system.
- Promote a full range of online learning experiences for students and teachers, including teacher-supported, hybrid, and independent activities to meet the varied needs of learners and to provide a platform for technology integration.

Recommendations for State Leaders

- Revise content standards in all curricular areas to better reflect the necessary learning outcomes for digital-age learners.
- Revise standardized assessment methods to better represent the learning outcomes for digital-age learners, including meaningful feedback on challenge-based learning experiences as a component of the accountability system.
- Immediately allow flexibility with respect to the requirements of "seat time" as a driver for school attendance, financing, and reporting. Replace this with models that support various modes of online participation in schools.
- Expand instructional materials to include the use of mobile platforms and online information resources. This would establish a new model that would transform California and district adoptions to include online curricular series that integrate web-based, media-rich, adaptive materials aligned to state standards and 21st century literacy skills.

Overview – Technology for Teaching and Learning

California is in the throes of a crisis in education, one that could jeopardize our future as well as our economy's ability to remain competitive. We take pride in California's role in promoting global interdependence and innovation. We understand that our educational system must respond to the rapidly increasing complexity that is evident in society.

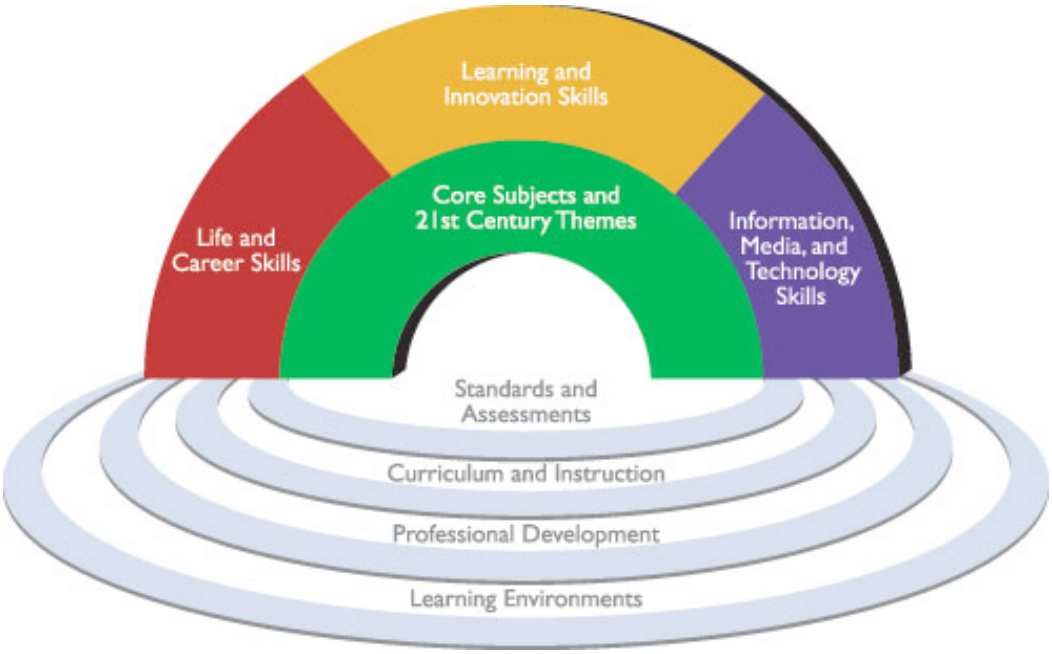
Today's classrooms are filled with young people who are accustomed to ubiquitous access to gadgets and gizmos. Unfortunately, the use of technology by these students generally stops at the school door where they are expected to put away their cell phones and iPods for an opportunity to return to the archaic pencil/paper note taking and operations.

Our high school students are vulnerable. Every 29 seconds in the United States, a student disappoints teachers and parents by dropping out of school (Diplomas Count, 2007). This year alone, one in every three high school students will not graduate (Laird et al, 2007) and dropout rates are higher than the average for underrepresented minority students, including African Americans, Hispanics, English learners, and those with disabilities (IES National Center for Educational Statistics, 2010). The most recent data from California, collected in 2009 for the 2007/2008 school year, notes a four-year derived dropout rate of 20.1 percent (O'Connell, 2009).

In a world of rapid change and global markets, the education of young people needs to focus on strong academic skills such as math and a science, tangible skills such as language proficiency, and the ability to be creative and adaptive, especially since our schools are preparing students for future jobs in fields that may not currently exist. And the lack of doing so could have enormously negative consequences. Current research shows that students who secure jobs in professions where innovative thinking is required earn more than 50 percent more than jobs that require little to no innovation (Uhalde et al, 2006).

Twenty years ago, classrooms focused on core subject areas where students sat at tables or in rows, receiving the information bestowed upon them and regurgitating it for the periodic quiz and exam. In comparison, today's students can whip out a computer or cell phone and find the answers to their questions with a sense of immediacy that would have required the former students hours of work in a library if accessible at all. The challenge is that today's students are not only wired differently, but their ability to think and process information is enhanced with constant stimulation and interactivity, which may not be met in the average classroom. Classrooms have to transform from information input centers to places where students can develop the critical skills needed in the 21st century workplace: creative thinking, the ability to work with others, and effective communication skills.

To make these transitional changes, it is incumbent upon California's educators to help students develop the "21st century skills" needed to be engaged in learning and be inspired. Examples of 21st century skills include adaptability, accountability, problem solving, critical thinking, and media, civic, and information literacy (Partnership for 21st Century Schools, 2010).



Partnership for 21st Century Schools

Most schools continue to use a model that was designed to prepare students for life in the middle of the 20th century. Ensuring students have a strong foundation in reading, math, and other core subjects is as important as ever, yet these skills alone are insufficient for success in the 21st century. Students

must learn to think both critically and creatively, evaluate massive amounts of information, solve complex problems and communicate well to meet the demands ahead of them.

Amongst the mission of ACSA is the objective to "*ensure all students have the essential skills and knowledge needed to excel.*" The link between academics, technology, and engagement are critical for the thinking and learning that takes place in California's K-12 classrooms. And the goal of ACSA's Technology Leadership Group is to "*support the empowerment of educational leaders in the use of technology for professional and educational excellence.*"

In support of the critical components of our mission as educators, this paper will provide context and recommendations so that educational leaders can better guide their constituents through the challenges of our transition to this new age. This position paper is the first in a series of four that will focus on the realms of technology. Subsequent position papers will go in depth into technology skills needed for 21st century leaders, effective technology policies, and how to use technology beyond the school community.

Technology Implications for Teachers

What does the future of education look like? According to researcher Clay Christensen, education is on the brink of a major overhaul. Forces around technology, innovation, and change will alter the face of educational practices in parallel to the ways disruptions have altered other industries. Schools and the educational delivery system, as currently structured, cannot continue to serve the vast array of student needs and desires in classroom environments that exclusively rely on stand and deliver instruction, multiple choice standardized assessment, and textbooks. And as Christensen predicts, the growth in Internet based learning will increase until 2019 when he expects computer-based delivery of education to exceed 50% of all high school classes (Christensen, 2008).

While there is evidence that supports direct instruction, traditional teaching and learning needs a swift and immediate change. The dominant style and approach have become increasingly ineffective with a generation of learners who have immediate access to information, are connected socially with intricate networks, and have an attention and focus approaches that require the delivery methods of teachers to be vastly different than their current, traditional state. While there will be a continued need to ensure a guaranteed and viable curriculum that is well-articulated at all levels, the demands of the digital age will require that new strategies extend existing practices.

One such new method is challenge based learning – an "engaging multidisciplinary approach to teaching and learning that encourages students to leverage the technology they use in their daily lives to solve real-world problems" (Apple, 2008). Strong student engagement is a result of hands-on, collaborative activities where students work with classmates, teachers, and other experts in their community in real life and online. By a focus on problem-solving situations, students are able to research issues, ask questions, reframe their focus, gain deeper subject area knowledge, solve challenges, and share those experiences with others (Lemke et al, 2009).

Recommendations for teachers:

- Permit and promote collaborative student projects in conjunction with individual measures of achievement.
- Include meaningful feedback on challenge-based learning experiences as part of the assessment and accountability system.
- Engage students as active directors of learning, guided by the teacher, and utilizing the vast array of reference materials and social networking opportunities to answer essential questions and solve real problems.

Technology Implications for Site Leaders

In support of this vision, there are several guiding principles that should be referenced in conceptualizing the ideal future of teaching and learning. In terms of a desired experience, we would suggest that learners would progress with an optimal balance of ability level and challenge. Csíkszentmihályi defines this as a flow, a state in which an individual operates with clear goals or expectations, a high degree of focus and attention, direct and immediate feedback, a sense of personal control, and intrinsic motivation to proceed (Csíkszentmihályi, 1991).

The Microsoft Partners in Learning program promotes a similar model in their custom learning program: School Leader Development: Building 21st Century Schools (Microsoft, 2010). Their model uses the term "adaptive expertise" to describe this balance between the level of challenge and the skills of the learner. Importantly, these models focus on the experience of the individual, each of which has different ability levels, skills and comfort levels with various challenges. The first guiding principle, whether it is called flow or adaptive expertise, fundamentally presupposes that differentiation occurs for each and every learner. This stands in stark contrast to our current delivery model that organizes students by birth date into similar age-groups and presumes that students will progress at more or less the same rate through a variety of academic content.

Well-designed and taught goals and objectives can increase student achievement, especially when the goals are at the right difficulty level for student achievement: not too easy to bore students, yet not too difficult to cause frustration (Marzano, 2009). Ongoing assessment and modifications are also critical in ensuring that both the instruction and the learning are truly adaptive. As we have seen, these formative assessments can provide meaningful feedback that accelerates learning by using a variety of methods (Marzano, 2010). Site leaders will be instrumental in facilitating the effective implementation of technology resources to assist staff, students, and the community in creating, communicating, and utilizing these customized goals and the abundance of achievement data to provide an optimal balance of challenge and expertise for each and every learner.

Recommendations for Site Leaders:

- Provide resources and training to assist teachers in implementing and facilitating challenge-based learning experiences for all students.
- Provide resources and training to accelerate the shift to customized learning experiences to promote flow learning and develop adaptive expertise.
- Support key site-based initiatives and promote exemplars which integrate technology applications into the standards-based curricula.

Technology Implications for District Leaders

Current technology can be used to assist in the design and delivery of learning experiences that are intended to help learners progress through balancing the level of challenge based on their unique background and skill set. Consider, for example how a group of learners can have a common goal or expectation but progress through a series of increasingly difficult exercises based on their performance. This has long been the design of computer-assisted instruction (CAI) packages that have been used with varying degrees of success in a number or settings. In each of these programs, ongoing and diagnostic assessment information is used to provide the learner with immediate feedback that guides the next series of exercises. However, conventional CAI programs resembled computer-based worksheets that merely took advantage of the technical ability to quickly score and sequence the questions. In other words, these were "drill and practice" programs that continued to rely on a separate instructional component.

There are now examples of programs that begin with a diagnostic inventory and then schedule students individually into asynchronous, online learning experiences that actually teach the student through web-conferences, online videos, animated tutorials, peer demonstrations, and independent reviews of resources (Houghton Mifflin, 2010). Following completion of the learning experiences, interim assessment modules are deployed to determine if additional instruction is required before students move to an application phase.

Student progress can be instantaneously monitored through interactive, visually-rich data systems. Student rating systems can help to determine the effectiveness or the various learning experiences and the best lessons can then be highlighted for subsequent learners. An abundance of research confirms the value of specific and immediate feedback that accelerate student learning.

Another engaging approach is to move from the use of Web 1.0 to Web 2.0. Web 1.0 is the use of the Internet for information retrieval. Web 2.0 takes learning a step further into highly interactive, participatory environments with the creation and sharing of intellectual and social resources by the end users – you and me. In other words, Web 1.0 is the "read only" web while Web 2.0 is the "read/write" version. Examples of Web 2.0 include Google Docs, blogs, wikis, and social groups like Facebook and Ning where users can create personalized pages of information to share with others.

Regardless of the particular tool, these experiences will increasingly be delivered through mobile devices in asynchronous, anytime-anywhere platforms. The combined impact of challenge-based learning—with a focus on application and projects—and customized skill-based learning are different models than the traditional stand-and-deliver, one-size-fits-all instruction that most adults experienced when they were in school.

Recommendations for District Leaders:

- Revisit the concept of age-based grouping and deploy several alternatives to this approach to guide schools in optimal grouping arrangements.
- Permit and promote new tools for communication and service such as blogs, wikis, webinars, SMS and RSS feeds, etc.
- Provide resources and support to ensure that all students have access to online digital tools at school and in their homes.

- Include meaningful feedback on challenge-based learning experiences as part of the assessment and accountability system.
- Promote a full range of online learning experiences for students and teachers, including teacher-supported, hybrid, and independent activities to meet the varied needs of learners and to provide a platform for technology integration.

Technology Implications for State Leaders

Three important dimensions comprise teaching and learning: the written curriculum, the taught curriculum, and the assessed curriculum. California has focused on academic standards to define the idealized learning outcomes for students. In the standards-based system, these learning outcomes drive both the taught and the assessed components of the teaching and learning experience. The English Language Arts, Math Science, and Social Studies Standards were adopted by the State Board of Education in 1997 and 1998. It should be noted that, at the time, only 55% of schools and perhaps one-fourth of classrooms in California were connected to the Internet. 1998 was also "PG" (pre-Google). Google use grew by 70,000% just from 1998 to 1999 with a staggering 7,000,000 searches each day. By the end of the following year that number grew to over 100 million daily searches (Ingram, 2008).

The recent Williams settlement requires schools to use only those curricular materials that have been approved by the California Department of Education. Adherence to these adopted materials shapes the "taught" curriculum with defined instructional practices, allocations of time devoted to particular subjects, and common pacing guidelines. Political changes, such as the implementation of NCLB, have focused efforts on strategies and programs that we hope will improve students' ability to demonstrate achievement on multiple choice tests.

The need for reforming the accountability and assessment system has been articulated by ACSA in a recent taskforce report (ACSA, 2010). The current model, in many ways, has narrowed our curricular focus such that personalized, open-ended, project-based, multidisciplinary efforts have fallen out of favor. Unfortunately, the combined impact of the standardized-test-driven accountability movement and the prescriptive nature of conventional textbook instruction have been impediments in terms of technological risk-taking, creativity and implementation in schools.

Recommendation for State Leaders:

- Revise content standards in all curricular areas to better reflect the necessary learning outcomes for digital-age learners.
- Revise standardized assessment methods to better represent the learning outcomes for digital-age learners, including meaningful feedback on challenge-based learning experiences as a component of the accountability system.
- Immediately allow flexibility with respect to the requirements of "seat time" as a driver for school attendance, financing, and reporting. Replace this with models that support various modes of online participation in schools.
- Expand instructional materials to include the use of mobile platforms and online information resources. This would establish a new model that would transform California and district adoptions to include online curricular series that integrate web-based, media-rich, adaptive materials aligned to state standards and 21st century literacy skills.

Conclusion: Redefining the Metaphor

The focus on a narrowly defined set of right/wrong questions is also reflective of the industrial age, assembly-line approach to public education. Peter Senge asserts that "few of us today appreciate how deeply assembly-line concepts are embedded in the modern school." Essentially, students have moved through the system much the same way as a Model-T was assembled almost a century ago. In schools, expert teachers along the assembly line each contribute a small piece to the final product, efficiently ensuring that all students have gone through the appropriate procedures with regard to their area of specialty. If each teacher does his or her task well, the student will exit the "assembly line" as well-rounded individual.

In the assembly lines of the industrial era, the ideal outcome was the production of a consistent product that would be indistinguishable from others. Henry Ford went so far as to have each car painted the same color while he made claims that customers could have it painted "any color they want so long as it's black" (Zaccai, 2005).

In many ways, American schools have approached the monumental task of educating children with a similar sentiment. One could rephrase Ford's statement to "the students can have any experiences they want so long as they score proficient or advance on the multiple-choice exams administered once a year." This line of thinking is increasingly at odds with the increasingly complex, globalized, information-rich society of the 21st century. The modern assembly lines of the information age don't operate like traditional assembly lines. Even industrial manufacturing companies have abandoned Ford's approach: "The assembly line was the epitome of work in the old economy. It was both a tool and an expression of the relationship between the worker and the work, the product and the customer. In the old economy, every converter for every customer flowed along the same assembly line and was worked on by the same set of hands, doing the same tasks, over and over again. In an economy based on customization, "speed, quality, and flexibility, the mechanical assembly line has given way to the biological cell" (Dorsey, 2000. p. 210). Multi-tasking employees are organized into "cells," each of which takes the product from beginning to end. These cells allow for fluidity, versatility, and customization made impossible using the old assembly line model. Workstations are built in modular components. "Nothing is bolted to the floor permanently, and everything can be broken down and reassembled in the event of sudden surprise order or an unanticipated problem" (Dorsey, p. 210).

The modern, cellular manufacturing approach that emphasizes integration, speed, fluidity, and customization is directly at odds with the standards-based, forced-choice exam experience of a typical school day. While students are accustomed to an on-demand, wired, customized, networked world outside of school, they are often asked to power down, sit down, and complete discrete tasks independently in class. It should thus come as no surprise that we now find higher rates of disengagement and disenchantment.

It is now time to revisit the fundamental concepts that underlie the constructs of our educational system. Revising content standards to reflect the information-rich, turbulent, global, and digital society is a necessary step. Aligning the assessment and accountability with the updated standards which provide integrity and increase relevance and utility of the feedback systems. Expanding instructional materials to include the use of mobile platforms and online information resources is also an important move in helping to transition out of the industrial-age approach to schooling.

These systemic changes must be facilitated at all levels of the complex network of the educational system. District leaders must be open to new approaches to student grouping, promoting web 2.0 interactive platforms, and building from meaningful, challenge-based learning experiences into their local assessment systems.

Site leaders must also promote technology integration, coupled with challenge-based learning experiences and be advocates for optimal balance of difficulty and ability to improve student engagement and flow experiences in their learning. Site leaders must also organize, support, and nurture ongoing learning from staff to adjust teaching strategies that promote collaborative and meaningful student learning. These learning experiences must go beyond right and wrong answers, printed textbooks, and confinement to a conventional classroom environment.

Armed with anytime, anywhere access to the abundant interactive world-wide web, students should spend their time working with one another to master the updated standards and demonstrate their capacity through application of problem-solving on authentic projects. Their experience must be fluid, dynamic, and evolving based on their progress, interests, and passions. With more engaged students that are developing meaningful knowledge and skills that are better aligned with the information age, we can realize the ambitious vision of building capacity for our nation to thrive in this new age.

Resources

It is important to note that ACSA is not alone in articulating a need to redefine the vision of teaching and learning in this digital age. A number of resources exist that similarly highlight the gap between our conventional model and the current needs. The following resources can be used to design school/district technology plans, review examples of technology used in innovative ways, and provide additional insight into the use of technology:

- Apple Classroom of Tomorrow Today
- School 2.0
- Horizon Report

The following organizations and programs have additional resources that can be used by schools and districts in their use of and expansion of technology:

- Microsoft Partners in Learning School Leader Development
- Partnership for 21st Century Skills
- ISTE/NETS
- CTAP
- TICAL
- Leadership 3.0

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