2019-2022 District Technology Plan

Section One: Statement of Philosophy: Educational Technology

Where Are We Going?

In A New Culture of Learning, authors Douglas Thomas and John Seely Brown challenge readers to consider a new paradigm for learning:

When we think about what a new educational environment might look like in the twenty-first century, we can imagine a number of things. Imagine an environment that is constantly changing. Imagine an environment where the participants are building, creating, and participating in a massive network of dozens of databases, hundreds of wikis and websites, and thousands of message forums, literally creating a large-scale knowledge economy. Imagine an environment where participants are constantly measuring and evaluating their own performances, even if that requires them to build new tools to do it. Imagine an environment where evaluation is based on after-action reviews not to determine rewards but to continually enhance performance.

To an extent, this "new culture of learning" expressed by Thomas and Brown is reflective of changes caused by the democratization of the web. Access is becoming ubiquitous. Increased participation on the web has revolutionized the flow of information, media, ideas, and products between a global community of connected citizens. Chris Anderson poignantly depicts the transformative nature of a democratized web in Makers: The New Industrial Revolution, when he says, "today we are spoiled by the easy pickings of the web. Any kid with an idea and a laptop can create the seeds of a world-changing company—just look at Mark Zuckerberg and Facebook."

For educators, the notion of what it means to be college and career ready has been influenced by realities of living and working in the Digital Age. The sense that schools exists in a vacuum isolated from changes transpiring in the professional world is a severely flawed belief. This is especially apparent when reading through the Common Core Standards. Even though the Common Core emphasizes traditional academic literacies such as reading, writing, and math, Common Core Standards also establish a priority for schools to cultivate students who are digitally literate. Architects of the Common Core Standards included this commentary about technology in their graduate profile:

Students employ technology thoughtfully to enhance their reading, writing, speaking, listening, and language use. They tailor their searches online to acquire useful information efficiently, and they integrate what they learn using technology with what they learn offline. They are familiar

with the strengths and limitations of various technological tools and mediums and can select and use those best suited to their communication goals.

To prepare students for the unique and ever-evolving challenges of living and working in the Digital Age, the Caldwell-West Caldwell School District aspires to foster global classrooms where the development of the 4C's; communication, collaboration, critical thinking and creativity shape actions taken by students and teachers. The 4Cs represent the hierarchy of skills privileged in the Digital Age. Students who demonstrate the ability to communicate ideas to diverse audiences, build high functioning teams, and conceive of innovative solutions are well suited to face 21st Century challenges.

In order to achieve district goals, CWC understands that students must be effective learners, collaborators, communicators and creators. CWC students will become:

1. Effective Communicators: Students use appropriate media to effectively communicate ideas, knowledge, and understanding to audiences ranging from local to global.

- **Vision Statement: Learning Environment**: Ubiquitous access to technology tools and resources will enhance our learning environment, expanding horizons beyond the physical classroom. This will empower CWC learners to access information, collaborate, and exchange ideas within the CWC community and around the world.

2. Effective Creators and Problem Solvers: Students demonstrate creative and critical thinking, construct knowledge, and develop innovative products and processes using appropriate technology.

- **Vision Statement: Educational Experiences**: Educational experiences will be authentic, imaginative, and provide for different learning paces and styles. Our staff will encourage learners to become independent and enterprising thinkers who will meet the challenges of a constantly changing world. Learners will also leverage the creative abilities of a learning network to solve complex problems.

3: Effective Collaborators: Students connect with peers and "experts" to collaborate, develop their own understanding, contribute to the learning of others, and offer perspective to the global society using a variety of media and online communities.

- **Vision Statement: Personal Learning Networks:** Stakeholders will leverage to power of personal learning networks to solve complex problems and contribute towards the growth of peers, members of the local community and those around the world.

To ensure that our students grow into effective communicators, creative and critical thinkers, and that they leverage collective action, technology will be uniquely positioned to transform learning. By privileging access and the ability to connect for our students, learners will develop marketable skills and knowledge necessary to succeed in the 21st century. As inquisitive, open-minded learners, students are able to acquire and apply content knowledge and skills through active exploration, interaction and cooperation with others. Our students will know more than just how to use technology— they will be able to manipulate technology to communicate, to build learning networks, to innovate, and to function as both consumers and producers of content.

How We Get There: Guiding Principles

To turn theory into action, the district will commit to making significant investments in its technological capacity. This translates into upgrading the digital infrastructure to support a diverse connected community, increasing organic access to connected devices, promoting as an expectation blended learning environments and establishing professional development opportunities which are driven by pedagogical initiatives. The process governing the transformation of technology in the school district will unfold over several years. The process will also be flexible, welcoming adjustments to closely mirror technological advancements.

The following core beliefs will help drive the technology plan.

1. The Power of Innovators

The integration and spread of best practices often stems from grassroots experiments. As opposed to "delivering" technology PD to the masses, small pockets of innovator receive constant supported. These innovators, strategically seeded in each building, are provided full-time access to connected devices in their classrooms. Innovators and administrators would work together to establish broad goals, but in essence, each teacher would have the freedom to prototype experiences for students. In return for full-time access, grassroots innovators would share their learning with peers and administrators through a variety of communication outlets (staff/department/grade-level meetings, Teacher Academy courses, personal blogs, classroom observations, co-teaching opportunities).

2. Learning Management System

Learning needs to be viewed as a 24/7 proposition. Inspiration, conversation and collaboration can no longer be boxed into a timeframe dictated to classroom participants by a school schedule. Instead, students and teachers require access to content and one another outside of a class period

and or school day. For this to occur, the traditional notion of classroom environment has to evolve to include communal online spaces. In a blended environment face-to-face encounters are supported through digitally mediated activities.

- At the elementary and middle school level a system such as Edmodo could serve as the consistent district-wide LMS platform
- At the high school a more robust system should be offered. A platform such as Canvas developed by Instructure represents the type of diverse system we would want high school students to exploit.
- Currently, Google Classroom is the most consistently used LMS across the district.

3. Diversified Open Use System

The district currently has in place an open access system. In each building there are designated computer labs or mobile computer carts. The intent is to provide equitable access to connected devices to the instructional staff. Open circulation systems in each building need to continue but these systems should be expanded to include access to an enhanced inventory of devices. A more robust inventory increases the number of devices included in an open circulation system and also sports a diverse collection of connected devices. The latter is needed in an instructional setting where students are positioned to create content. In an inquiry driven instructional setting student-led initiatives are frequent. To support classrooms where students have a sense of agency, options in regards to technological access is a necessity.

- Creation of mini design studios in each building. These mini design studios would vary in size (dependent upon space unique to each building). However, they would be similar across the district in that they would be open and contain iMacs with professional level editing software installed (Aperture, Final Cut Pro, Adobe Creative Suite…)
- Increase in the number of Computer on Wheels (COWS). This does not mean that each cart has to be completely filled. Having more carts available is a better alternative than having fewer carts filled to capacity with computers. Additionally, mixed media carts could be offered as well as carts which house different computers (think: chromebook cart, macbook cart…)
- The district should also increase carts containing handheld or tablet devices. iPad carts could straddle the line between open and dedicated use. The use of iPads should be leveraged in elementary classrooms and special education settings. The tactile nature of iPads is beneficial for elementary students (not to mention that elementary students are often first introduced to handheld technology at home). For special education,

accessibility functions on the iPad as well as access to third party applications are powerful assistive features.

4. Google Apps Digital Ecosystem

Google Apps for Education should serve as the anchor for the digital ecosystem across the district (see *Section Four: Google Apps Strategic Plan*). Leveraging the full potential of the Google Apps for Education suite of applications positions the district to cultivate classrooms where the 4Cs are developed.

5. Beyond NJSLA-Ready

Critical to the integration of technology is meeting NJSLA testing demands and ensuring that the instructional core is never compromised because of external mandates. The district should comfortably support a climate of high volume digital use. Even though usage will vary between buildings an expectation should exist that each stakeholder will use multiple devices when connecting to the internet. A one user to two or three device ratio should be relied on to assess our readiness. Just as important is building a scalable infrastructure. As much as the district plans for increased digital use, at times, the only way to accurately build what is needed is to learn through firsthand experience. Upgrades will have to be conducted in the moment. To do so, a flexible financial system has to be in place.

Section Two: Infrastructure Planning

A. Data Center

Our 76 district servers are comprised of both physical and virtual servers:
- 29 physical, including blades; 5 retired and 4 new ones added for running all of the desktop VMs (network needs to be configured for them). A new Citrix infrastructure will have to be rebuilt.
- 47 virtual (7 blades run them) and will be provisioned in the future as needed.

The servers have been upgraded.
Software-wise, we plan to upgrade our server again. The cost of the software is covered by our annual Microsoft licensing agreement.

The District Data Center (located at GCMS) has been redesigned to include new A/C, Air Flow distribution, rack enclosures and still planning for a dedicated generator (for Business Continuity). The first few years of its operation have been very successful.

Storage capability has been increased:
The new SAN will power all of the desktops greatly increasing performance at the user level
One old SAN has been moved to the HS and will be used as DR (Disaster Recovery).
Another old SAN will be dedicated to servers.

B. Infrastructure

All buildings are completely cabled. There is Internet access in all labs, classrooms, media centers and offices. Apart from the HS, where teachers use laptops, most classrooms are equipped with a zero client desktop used by the teacher.

Special attention has been be given to upgrading and expanding wireless coverage in order to sustain an increasing mobile technology base. The old APs haven been replaced with the new 2702 and 3602 APs which provide high-quality wireless coverage throughout the district, conforming to the latest WiFi standards (N and AC). At this time, almost every classroom has a dedicated wireless AP and additional APs have been mounted in public areas (hallways). High traffic areas such as gym, auditorium, cafeterias have also been addressed – at JCHS and Washington.
The network infrastructure has been upgraded with new 3850 PoE switches capable to power the new generation APs.
The District should consider expanding the wireless coverage to the gym/cafeteria spaces in the remaining schools.

A new, faster and more versatile firewall recently replaced the old one, which was not able to handle the increased traffic and the upgraded bandwidth. The old firewall is now serving as failover.

The Unified Communication Manager server, which is the heart of the phones system, has been upgraded and new Voice Gateway switches have been installed at each one of the schools.
The current paging system Informacast has been updated to the latest version 11.

C. Network Bandwidth

The District currently uses Internet service provided by Comcast, lately upgraded to 1 GBps (for about the same monthly price).

The District Internet utilization indicator is 86, calculated based on criteria provided by NJTrax.

This is the approximate percentage of our Internet bandwidth used for normal, everyday traffic.

Section Four: Google Apps Strategic Plan

The Caldwell-West Caldwell School District is a Google Apps for Education District. Faculty and students have a school-sponsored gmail account which provides access to an array of applications beyond email. Since access was provided, the use of Google Apps by faculty and students has been inconsistent. While more stakeholders are accessing available features each year, our district is only scratching the surface of what Google Apps for Education has to offer.

In looking ahead, it is the school district's intent to continue our partnership with Google and to fully leverage, K-12, the available suite of Google Apps. From 2015 to 2018, the district transitioned stakeholders to use Google Drive as the primary platform to store, share and collaboratively develop documents. By prioritizing the integration of Google Apps into daily practices, the district has taken a much needed step forward in accessing virtual platforms to foster real-time communication and collaboration between stakeholders. Google Apps now serves as the foundation for our rapidly evolving digital ecosystem.

Another initial step in the process was that teachers had the opportunity to participate in Google Apps Teacher Academy courses. For 2019-2022, the district may want to consider bringing back Google Apps Bootcamp or initiate some additional training for the newer staff members who were not here in 2015-18. As participants in the Google Apps Bootcamp, each educator agreed to pilot the integration of Google Apps in their classroom and to build a unique project highlighting the power of one or multiple Google Apps. Some members of the Bootcamp even took Google's certification exam and are now recognized as Google Apps experts. Continuing this kind of work could be a way of ensuring that our newer staff have the same opportunities that were afforded others as we were first launching Google Apps in the district.

For 2015-18, a concerted effort was made to increase access to connected devices and to upgrade the digital infrastructure at each school. We also piloted 1:1 classrooms at various locations and have made an attempt to promote our 6-12 BYOD policy. In 2018-19, GCMS has more chromebooks than students, so while they do not allow students to bring home devices, the classrooms are definitely technology-rich enough to provide considerable access. The heightened use of Google Apps is another important piece in the evolving attempt to access technology in powerful and transformative ways.

<u>Action Plan</u>

The following outcomes are sought through the Action Plan.

1. Solidify Google Apps as the primary communication tool in the district
2. Solidify Google Apps as the primary platform to store documents
3. Varied and extensive use of the Google Apps for Education suite
4. Creation of in-house experts through offering Google certification opportunities and professional development sessions

It was noted in one of our 2019 Technology Committee meetings that Microsoft applications may become available to students beginning in September 2019. The Committee felt it would be best to limit this to secondary, possibly even high school only.

Section Five: Professional Development

Professional development needs to exist in layers, and these layers vary in terms of formality and timeliness. There must be a formal training prior to the start of implementation on how to design instruction and assessment and utilize digital tools. Informally, sessions where teachers are allowed to discuss a technique, tool, or a "how do you teach this...?" lets teachers receive hands-on training. Regardless of the level of formality, professional development should spend most of its time in the stage of "coaching and feedback". Privileging conversation in professional development is critical to foster an open network where ideas, resources, samples of student work and personal experiences are freely exchanged.

Opportunities provided by the district intend to build the capacity within each educator to consider three attributes when crafting learning engagements for 21st Century classroom: 1) the tool, 2) the purpose, and 3) the place in the curriculum where to integrate technology. The order, however, in which these attributes are applied matters. A common mistake is to start with the tool. If this happens, it becomes about the tool (Chromebook, iPad...) in the classroom and key learning outcomes are of secondary importance. Instead, teachers must consider purpose first: what is we want students to learn and why, what do we want students doing and why does this action matter?

Venues for PD

- CWC Teacher Academy Sessions
- Summer Institutes
- Online Courses (MOOCs)
- Teacher Certification Programs (Google Certified Educator, Apple Distinguished Educator)

<u>Professional development needs/costs, 2019-22</u>

Professional Development will focus on:

1. building the capacity of teachers in designing quality assessment tasks that are aligned with the New Jersey Student Learning Standards by incorporating meaningful and relevant technology
    a. support a Challenge-Based Learning initiative. Challenge Based Learning is a multidisciplinary approach to teaching and learning that encourages students to leverage the technology they use daily to solve real-world problems. Working backwards from a “Big Idea,” a challenge is defined and presented to students. Students work with a teacher(s) to establish a problem-solving process and ultimately, and to produce a viable solution.

2. teachers will have the opportunity to be trained in support of NJSLA and performance based assessments and be exposed to the current technology environment. In-district workshops and sessions are held on site to update current knowledge
3. building a lead group of in-house Google Apps certified experts to explore the integration of Google Apps in the classroom and to train future "expert" teachers
4. fostering the growth of STEM or STEAM in the district to span elementary, middle and high school
5. continuing to grow reader's and writer's workshop and to enhance multimodal forms of expression with this paradigm of instruction

Professional development funds are made available for supporting out of district workshops. There are also technology experts within our District who offer courses after school and facilitate user groups using the Professional Learning Communities model. These opportunities are available to all teachers and administrators.

Section Six: Planning for Technology Purchases

Traditionally, the district has made many technology purchases outside of the regular budget process, that is, without dedicated budget lines for student devices, staff devices, etc. In the previous technology planning process, lease-purchase programs were considered a potentially sensible way to approach the acquisition of new technology. However, the costs--interest, fees, etc.--appear to outweigh the benefits.

Instead, a sustainable plan for technology purchases may be a combination of budgeting a minimum amount of technology required for the coming school year, combined with purchases made from year-end savings in areas such as utilities, which vary from year to year and cannot be accurately predicted.

If the district is able to budget, for example, $100,000 for technology devices in the regular budget, but is also able to use an additional $100,000 generated by savings and budget efficiencies developed throughout the school year, a replacement schedule aligned with the expected 3-year life of a chromebook (though they sometimes last longer) is feasible.