Technology Issues
Summary of Trends and Findings

Trend 1: Continued growth in online courses.

- Online teaching is becoming more pervasive and will continue to grow. (Ng, 2011; Trends to Watch in Education Technology, 2011).

- The online classroom reflects a paradigm shift in curriculum delivery. Moving from a regular classroom to virtual setting requires creating an engaging environment, learning how to communicate with students who aren't physically present, and individualizing instruction. (Ash, 2011). Faculty need to transition to focus on facilitation of learning rather than presentation of knowledge (Pace, 2011).

- Instructors who can integrate technology effectively in a face-to-face classroom are not necessarily ready to teach online. While some comfort with technology is essential, faculty need to rethink the way in which they lead the class, and become accustomed to allowing students to direct their own learning. Faculty must depend on data and online feedback to evaluate whether students comprehend curriculum. The online classroom requires faculty to develop a tailored set of time-management skills, including daily communication and planning lessons well in advance (Ash, 2011).

- Learning Management Systems help instructors organize their content and provide some interactive options for students, such as chat, email, and digital drop box for submission of assignments (Pace, 2011). Most learning management systems are password protected to help authenticate that the student who registered for the course is the same student who participates in and completes the course or program (Compass Knowledge, 2010; Ng, 2011).

- Using an online course to prepare faculty to teach an online course can provide effective guidance and instruction at the same time that it assesses a teacher's readiness to teach online (Riedinger & Roseburg, 2006).

Trend 2: Increasing demand for mobile access to learning resources.

- As of May 2010, 59% of all adult Americans go online wirelessly, by using a laptop with a Wi-Fi connection or mobile broadband card, or by using the internet, email or instant messaging on a cell phone. In 2009, 51% of adult Americans went online wirelessly (Pew Internet, 2010).

- There is rapid growth in the use of personal mobile computing devices such as iPads, iPhones, Android devices, and netbooks (Thiele, 2010). In 2010, nearly 50% of middle and high school students carried a smart phone (Nastu, 2011). Users are taking advantage of a growing number of cell phone capabilities such as taking pictures, recording videos, and accessing the internet (Pew, 2010).

- More than half of all cell phone internet users go online daily from their mobile device, and by 2015 80% will be doing so. The percentage of students who use a mobile device to access the internet has increased from 10% to 43% in the last two years (Blackboard Mobile, 2011).

- Mobile devices will change the way students learn (Trends to Watch in Education Technology, 2011). People expect to be able to work, learn, and study whenever and wherever they want (New Media Consortium, 2011). Students expect instant and on the go access to information, and are using their mobile devices for everything (Campus Technology, 2011; Nastu, 2011).

- Colleges are undergoing a cultural shift to wireless technology as students demand increased bandwidth and Wi-Fi wireless access to the Internet (Campus Technology, 2011).

- The technologies we use are increasingly cloud-based. As we turn to mobile applications for immediate access to many resources and tasks that once were performed on desktop computers, it makes sense to move data and services into the cloud. The challenges of privacy and control continue to affect adoption and deployment (New Media Consortium, 2011).

- New technologies will continue to impact education. In the next year, electronic books and mobile devices will be the major technologies to watch. In 2-3 years, game-based learning and augmented reality (layering information over a view or representation of the normal world to enable users to access place-based information in intuitive ways) will expand. In 4-5 years, new technologies offering options for education will include gesture-based computing and learning analytics (data-gathering tools and analytic techniques to study student engagement, performance and progress in practice, with the goal of using the information to revise curricula, teaching and assessment in real time) (New Media Consortium, 2011).

- The digital divide will increase in terms of connectivity as well as in access to hardware (Thiele, 2010). Mobile learning presents significant issues of cost and accessibility for students who do not have the financial resources to purchase such devices (Nastu, 2011). About one-third of the 130,000 students attending the San Diego Unified School District do not have access to the Internet at home, with those students concentrated in the more ethnically diverse, lower income areas of the district (Magee, 2011). A greater percentage of white than Latino or African-American individuals have broadband access at home, although laptop ownership is now about even for these groups (Washington, 2011).

- African-Americans and Latinos are significantly more like to own a cell phone than are whites (87% of African Americans and Latinos own a cell phone, compared to 80% of whites), and outpace whites in their use of data applications on handheld devices (Pew Internet, 2010). However, people with the ability to go online on a computer at home are more engaged in a variety of uses of the internet than are those who rely on access from work or a phone (Washington, 2011).

Trend 3: New ways of creating, publishing and accessing information using technology.

- Digital media literacy continues to rise in importance as a key skill in every discipline and profession. (New Media Consortium, 2011)

- Technology is providing new ways in which to get information to students through open resources, including free online reference material, podcasts, wikis, blogs and thousands of learning portals (Bonk, 2010). However, appropriate metrics of evaluation of the quality of these publications lag behind the emergence of new scholarly forms of authoring, publishing and researching (New Media Consortium, 2011). The challenges of finding good content and changing classroom pedagogy to make the best use of new technologies (including mobile devices) must be addressed (Nastu, 2011).

- E-books and digital textbooks may be available at a cost savings to schools. Digital textbooks increasingly embed shared online video, animations and simulations to enhance learning (Bonk, 2010).

- The abundance of resources and relationships made easily accessible via the Internet is increasingly challenging educators to review their roles in sense-making, coaching, and credentialing (New Media Consortium, 2011).

- As the result of the Internet Corporation for Assigned Names and Numbers' approval of a new top-level domain (.xxx for x-rated website content), naming conventions for website URLs (".com" or ".org,") will expand beyond the few that currently exist. This could provide additional security and provide a better and more targeted search experience for consumers (Crawford, 2011).

Trend 4: Technology is used to support communication and collaboration.

- The world of work is increasingly collaborative (New Media Consortium, 2011). Technologies that promote collaboration (cloud, social networking, etc.) will need to be augmented in educational environments (Trends to Watch in Education Technology, 2011).

- More students are used to videoconferencing technology (using webcams or Skype) to communicate with people from long distances, so there is an increased expectation by students that this technology will be used so that absent students may attend class. Using videoconferencing enhances the allows opportunity to have guest speakers since there is no travel involved. However, setting up the classroom for videoconferencing takes additional time and required more technology support staff (Young, 2011).

- Social media, like Twitter and Facebook and other sharing technology, will change in the next few years: social media will happen much more through mobiles; people will share on networks what they used to share on listservs; most companies will have a social media policy that they enforce (Armano, 2009).

- Tablet PCs used in a slate format (which allowed for use of a stylus to write directly on the screen) can promote more fluid physical and verbal interaction between students (compared to Netbooks), resulting in more involvement by all in the group discussions (Alvarez, Brown & Nussbaum, 2011).

Trend 5: Technology places new demands on curriculum and instruction.

- The use of technology will facilitate the development of new disciplines and career opportunities.

    - Information Technology (IT) is a new academic discipline that combines traditional areas of computer science, information systems, and engineering, with customer advocacy and integration of computer technologies (Lunt, Ekstrom, Reichgelt, Bailey & LeBlanc, 2010).

    - Information Technology and Creative Practices (ITCP) is becoming a new, multi-disciplinary domain for information technology. A merger of information technology with the arts and humanities, the forms and products of ITCP include architectural designs, computer animated films, music, computer games, Web-based text, and interactive art exhibits (Mitchell, Inouye & Blumenthal, 2003).

    - Computer and Video Game design and development programs and/or courses are offered at over 300 universities and technical colleges across the U.S. These programs prepare students for careers in the growing video game industry (which grew 11.4% per year between 2005 and 2009), working as programmers, designers, developers, concept artists, 2 and 3 dimensional artists, animators, script and story writers (Education Software Association, 2010).

- Institutional technology plans (Kingsborough Community College, 2009; Washington State Board for Community and Technical Colleges, 2008) identify several key strategic issues for a community college utilizing technology. These strategic issues include:

    - Teaching, Learning and Research:

        - Ensure electronic access to textbooks, curriculum, and course material (e-Books). All courses should be web-enhanced even if they are not completely online. Use open resources, including widely shared, free course content and supplemental materials.

        - Online teaching and learning tools, including virtual labs, applications, streaming, and simulation

        - Support libraries to provide reliable access to electronic resources and online course management.

        - New delivery methods extend the reach of professional development, such as webinars and social networking software.

        - Integrate information technology efforts with local public schools and 4 year colleges so that there are seamless transitions.

- Student services, including an integrated online system where everything for student customer service is automated.
    - A one-stop portal should serve as a "dashboard" from which students can log in and have access to all their courses, financial aid accounts, educational plans, and grades.
    - Technology assistance must be provided for disabled students. The experience of taking a course with online content must be the same for all students. Online courses must be designed to provide built-in accommodation and/or content consistent with "industry standard" assistive computer technology. When links are provided to other web resources, those resources must be accessible as well. Professional development is needed to ensure that faculty understand what constitutes accessibility and recognize that methods which are adequate for short, simple or less important communications may not be equally effective or appropriate for longer, more complex, or more critical material (Distance Education Accessibility Guidelines Task Force, 2011)
- Enterprise Technology (Information Technology infrastructure);
    - Enhance online communication and collaboration through robust portal technologies for students, faculty and staff.
    - Communications through robust video teleconferencing and mobile technologies
- Technology Support Services
    - Help desk services are critical for user support.
    - Online courses and use of videoconferencing in the classroom require more technology support staff (Young, 2011).
- Protecting Technology, Data and Assets.
    - The open environment creates security concerns and the need for strong anti-virus and spam protection (Campus Technology, 2011).
    - Online security awareness for all students, faculty and staff.
    - A disaster recovery plan.

- Colleges will be able to capture huge amounts of data, which they need to turn into "actionable insight" -- understandings that are useful to us, and that we do something about (Trends to Watch in Education Technology, 2011).

- Economic pressures and new models of education are presenting unprecedented competition to traditional models of the university (New Media Consortium, 2011). Excitement about changing practices and adding resources is tempered by budget concerns (Thiele, 2010).

Scan Team findings and implications for the Grossmont-Cuyamaca Community College District (GCCCD:

Finding 1: Better inform employees within the GCCCD about the technology revolution that is occurring and the role that technology plays in learning.

Finding 2: Enhance faculty professional development to include (1) online teaching certification and mentoring required to meet the demands of online teaching and learning; (2) effective pedagogical uses of technology (course management systems, webcams, video-conferencing and archiving, etc.).

Finding 3: Enhance staff support and staff professional development to meet increased technology use.

Finding 4: Incorporate open resource alternatives that include traditional textbook alternatives (i.e., e-textbooks, open source software) as well as collaborative learning environments (cloud and social networking options).

Finding 5: Commit GCCCD resources (training, financial, infrastructure, Wi-Fi capability) to meet the growing demand and use of technology in student learning.

Finding 6: Develop a GCCCD one-stop portal for students that integrates instructional and student support services online.

Finding 7: Integrate technology with local high schools and four-year institutions to enhance and promote opportunities for seamless educational transition.

Finding 8: Enhance student learning by taking advantage of the many mobile devices (smart phones, tablet PCs, etc.) that are available and seeing increased usage by our students.

Finding 9: Update curriculum as necessary to reflect changes in community and program needs, including addressing increasing emphasis on Information Technology and Video Gaming as well as increased emphasis on cross-disciplinary programs (i.e., Information Technology and Creative Practices).

Finding 10: Incorporate social media (a prevalent trend) to reach students for instructional outreach and student support services.

Finding 11: Maintain currency on accessibility as we rely more on technology for delivery of instructional programs and student support services.

Finding 12: Explore green technologies in an effort to be more sustainable and help address increasing energy costs. (Note: the related articles have been moved to the environment section.)