Academic Technology Baseline

Version 2.6

Revision History

Date	Version	Description	Author
4/22/2008	1.0	Original release (internal)	Jennifer Spahn and Phil Hill
4/23/2008	1.1	Shared with DATS for feedback	Jennifer Spahn and Phil Hill
5/8/2008	1.2	Incorporate DATs feedback from conference call; created major content sections for baseline definition	Jennifer Spahn and Phil Hill
5/27/2008	2.0	Prepared for DAT Retreat	Jennifer Spahn and Phil Hill
6/12/2008	2.1	Incorporated DAT comments from retreat	Jennifer Spahn and Phil Hill
6/22/2008	2.2	Added section on smart classrooms and incorporated additional comments	Jennifer Spahn and Phil Hill
6/24/2008	2.3	Updated smart classroom and Use Case consolidation	Jennifer Spahn and Phil Hill
7/8/2008	2.3.1	Incorporate DAT comments from June meeting	Jennifer Spahn and Phil Hill
7/16/2008	2.4	Incorporate new diagrams, reorganized sections, modified use cases. Added new section by Maggie Beers on Millennial faculty and students, AT governance, F & S support, project management, and ePortfolios.	Jennifer Spahn and Phil Hill
8/1/2008	2.5	Incorporate comments from Gerry Hanley and other DATs.	Jennifer Spahn and Phil Hill
8/5/08	2.5a	Rearrange section 3, etc.	Kathy F.
8/5/08	2.5c	Added Appendix	Jennifer Spahn
8/11/08	2.6	Incorporated comments from Kathy Fernandes, Maggie Beers, and Barbara Butler.	Jennifer Spahn and Phil Hill

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1. Executive Summary

The CSU Information Technology Strategy (ITS), created in the late 1990's, stressed the need for the CSU to create a unified network and a baseline of hardware, software, training and support to create the most productive and effective computing environment for each campus. This foundation is key to the Academic Technology Baseline today. Without ITS, the Academic Technology Baseline would have nothing to stand on. However, it is now time for the CSU to create a unified Academic Technology Baseline.

The goal of this report is to develop an Academic Technology Baseline document for planning and discussion consulting the normal CSU advisory committees and processes.

The Academic Technology Baseline will give California State University campuses needed information to self-assess their current state of academic technology versus a well-defined standard. This self-assessment will identify gaps in services and infrastructure based on best practices and research into the effective use of technology to support the academic mission.

In order for Academic Technology to be used effectively and successfully, the following elements need to be addressed:

- Educational Practice – How will technology be used? What are the best practices? Is the use of technology being used wisely and effectively? What educational research is being conducted? What are the effective practices for integrating technology into instruction?
- Support Structures – How is the campus community or constituency taught to use the technology and educational practices? How are the technology and educational practices supported? How are the students and their learning objectives supported? How does the help desk support the technology?
- Technology – What technology applications and hardware will support our academic mission? What enterprise-level applications should be selected, integrated, and deployed in a campus environment? What technologies should be explored for innovative usage?

Many universities within the CSU system have traditionally supported students and faculty in their use of academic technology through several distributed service units, each with discrete mandates and target audiences with respect to teaching, learning, and technical skills development.

An integrated support model for academic technology, therefore, presents an interesting dilemma, since it requires the university to rethink two assumptions associated with more traditional methods of instruction: that faculty can be supported independently from the students they teach, and that technical skills can be developed in isolation from cognitive skills.

Indeed, faculty are best supported when their students are supported, so they are free to focus on the art of teaching and research. Furthermore, it is in the physical, and what some refer to as technical, act of creating and assembling digital artifacts, or interacting in online discussions, that deep reflection occurs and new cognitive levels can be reached.

In the case academic technology, faculty and students are best served by a collaborative, and integrated service model, in which administrative lines between service units are invisible to the end user, with services provided based on the need of the individual, rather than the historic mandate of the unit.

Albright and Nworie (2008) recommend establishing

> *a senior academic technology officer* (SATO) to provide strategic leadership and direction for academic technology applications, initiatives, and support services across the broad spectrum of technology functions; provide leadership in planning and policy related to curriculum development, e-learning, and other instructional technology initiatives that facilitate achievement of the institution's strategic goals; and build partnerships among

campus academic support units to work collaboratively toward achievement of institutional goals that can be addressed through instructional technology.

With the role in place, academic technology units offer the promise of campus partnerships with other academic support organizations that could focus on themes such as improving access to resources for scholarship, facilitating communities of learners, assessing learning, coordinating professional development programming for faculty, planning for academic technology and distance learning, identifying and promoting best practices related to teaching and learning, particularly technology-based learning, and aligning technology with pedagogy (Albright & Nworie, 2008, p. 17).

Given the expanding scope of usage for academic technology, we need to describe the key components of academic technology that are needed to support the academic mission. The current baselines as well as the stretch baselines (where the campuses should be at in 3 to 5 years) will also be identified.

In this report, we will define an Academic Technology Baseline across the three key elements of educational practices, support structures and technology itself, as shown below.

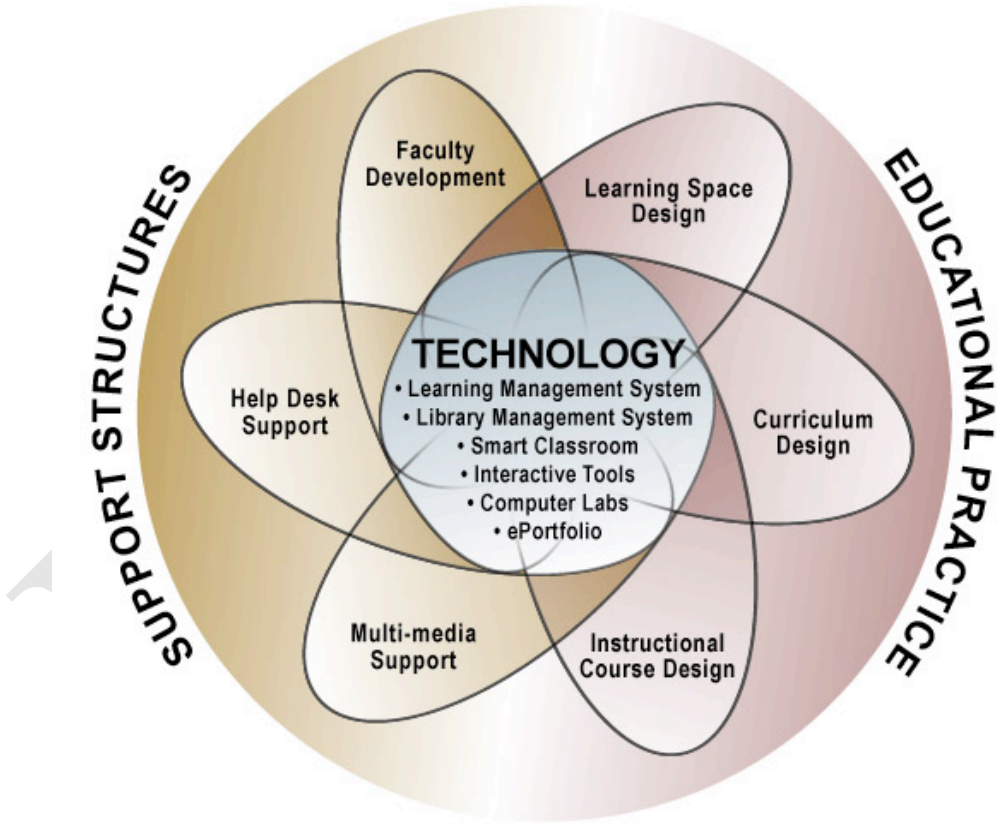


Figure 1 - Academic Technology Elements include Educational Practice, Support Structures, and Technology

For each of the elements above, we shall define a *current baseline* – where each campus should be today – and a *stretch baseline* – where advanced campuses should strive to be, or where we see the future direction of academic technology.

2. Overview

2.1 Vision

As described by the Academic Technology Planning Committee, the vision for academic technology within the California State University (CSU) is to support learning environments to enhance student success.

Academic Technology Vision

In the CSU, Academic Technology supports learning environments everywhere, anytime.

Supports . . . quality teaching and learning communities;
Learning . . . skills, knowledge, and attitudes for success;
Environments . . . enabling effective learning accessible to all;
Everywhere . . . students learn in local and global environments;
Anytime . . . in a person's day, career, and life;

2.2 Academic Technology Baseline Background

The CSU Information Technology Strategy (ITS), created in the late 1990's, stressed the need for the CSU to create a unified network and a baseline of hardware, software, training and support to create the most productive and effective computing environment for each campus. This foundation is key to the Academic Technology Baseline today. Without ITS, the Academic Technology Baseline would have nothing to stand on. However, it is now time for the CSU to create a unified Academic Technology Baseline.

Unlike Common Management Systems (CMS) and the Technology Infrastructure Initiative (TII), academic technology has never had a system wide funding commitment, apart from some library initiatives such as the electronic core collection. Most academic technology resources and services are distributed throughout the disciplinary colleges on CSU campuses, and funding these units is a constant challenge as student and faculty demands for computing and network support continue to increase. At the executive council retreat in summer 2004, CSU campus presidents expressed a strong interest in learning more about the status of IT-related spending in the system, areas of funding shortfalls, and sources and strategies for addressing them. The 2005 IT Funding Gap Study was a step in that direction.

The purpose of the Academic Technology Assessment Framework (ATAF) discussions in November and December 2007 was to further develop the system's understanding of academic technology needs. The ATAF was to give California State University campuses templates and tools to self-assess their academic technology baseline. This self-assessment will eventually identify gaps in services and infrastructure based on best practices and research into the effective use of technology to support the academic mission.

One of the key components of the original ATAF plan was for the distribution of additional baseline funding for academic technology across the CSU. As of January 2008, this new funding is no longer available. However, our current effort as documented in this report is to develop the Academic Technology Baseline and help campuses understand their current status versus the baseline.

2.3 Audience

The Academic Technology Baseline is designed to be a tool for all major stakeholders to use in evaluating and improving the state of academic technology on each campus. Furthermore, it is crucial for the people leading academic technology initiatives to be able to communicate with administration and campus constituencies involved in academics and technology.

Key CSU audiences for this report are as follows:

- Academic Technology Advisory Groups
- Campus Academic leaders (including Academic Technology Advisory Committee)
- Campus Constituents
- Campus IT leaders (including Information Technology Advisory Committee)
- Chancellor's Office
- Colleges of Extended Learning
- Council of Library Deans (COLD)
- Directors of Academic Technology (DAT)
- Disabled Student Services (DSS)
- Faculty Development Council
- Facility Planning
- Identity Access Management (IAM)
- Senate Advisory Groups

2.4 Project Objectives and Goals

The goal of this work is to develop an Academic Technology Baseline document for planning and discussion consulting the normal CSU advisory committees and processes.

The Academic Technology Baseline will give California State University campuses needed information to self-assess their current state of academic technology versus a well-defined standard. This self-assessment will identify gaps in services and infrastructure based on best practices and research into the effective use of technology to support the academic mission.

The objectives of this project are:

- Create initial academic technology baseline definition document as a planning and discussion tool for CSU committee meetings, ensuring that the baseline meets CSU strategic goals for academic technology; and
- Coordinate feedback with designated campus representatives, ensuring that campuses can use the baseline document to evaluate their own academic technology infrastructure.

2.5 Academic Technology Definition

Academic Technology will be defined as technology and services that are applied directly in the teaching and learning, research and scholarship processes. That is, technology and services that are integrated into the curriculum and/or directly support and advance the teaching and learning mission of the institution.

3. Academic Technology Background

According to "Rethinking Academic Technology Leadership in an Era of Change" (Albright & Nworie, 2008) published in the first 2008 installment of EDUCAUSE Quarterly, institutions are placing increased importance on technology to strengthen academic programs, increase access, and provide new and improved models for curriculum development and delivery. As a result of this focus, large amounts of money are being spent on the technology and the systems needed to support it.

In order to understand the current environment, this section will cover the elements of the current academic technology environment: 1) educational practices, 2) support structures and 3) technology. This section will also consider the faculty and students expectations in today's technology environment, the trends we currently see, and the initiatives that are important to consider. Lastly, since the field of academic technology is expanding considerably, this section will also address the lack of clarity in academic technology leadership on campuses.

3.1 Elements of the Academic Technology Environment

In order for academic technology to be used effectively and successfully, the following elements need to be addressed:

- Educational Practice – How will the technology be used? What are the best practices? Is it being used wisely and effectively? What educational research is being conducted? What are the effective practices for integrating technology into instruction?
- Support Structures – How is the campus community or constituency taught to use the technology and educational practices? How are the technology and educational practices supported? How are the students and their achievement of learning objectives supported? How does the help desk support the use of technology?
- Technology – What technology applications and hardware will support our academic mission? What enterprise-level applications should be selected, integrated, and deployed in a campus environment? What technologies should be explored for innovative usage?

3.1 Who are Millennial Students?

There has been increasing attention given to the new populations of students entering our post-secondary institutions, including "non-traditional" and "millennial" students, and the need for campuses to adapt our infrastructures and organizations to meet their rising expectations and needs.

The National Center or Education Statistics reported in 2003 that three-quarters of all undergraduate students are "non-traditional" in that they have one or more of the following characteristics: delayed enrollment, attend part-time, work full-time, are financially independent, have dependents, are single parents, or lack a high-school diploma. "The implications are that campus populations today are quite different from those in the days when college or university decision-makers were students (Oblinger, 2003, p. 38)."

In addition to the diverse non-traditional students, Millennial students, who were born after 1982, are increasingly comprising university populations. These Millennials bring with them different attitudes and aptitudes from previous generations, most notably with respect to technology and customer service. As a group, Oblinger (2003, p. 38) reports that Millennials exhibit these characteristics:

- Gravitate toward group activity
- Identify with their parents' values
- Spend less time watching TV and more time doing homework
- Believe it's "cool to be smart"

- Are fascinated by new technologies
- Are racially and ethnically diverse, and
- Often have at least one immigrant parent

In general, their learning preferences tend toward teamwork, experiential activities, structure, and the use of technology. These students have grown up with computers and the Internet, and have emerged with an "information-age mindset" which Jason Frand, as cited in Oblinger's (2003) article, describes with these ten attributes:

- *Computers aren't technology*, they are an assumed part of life
- *The Internet is better than TV*, because it is interactive and allows for socializing
- *Reality is no longer real*, as demonstrated by altered digital images, misrepresentation through email, and inaccurate web content
- *Learning more closely resembles Nintendo than logic*, with trial-and-error approaches to problem-solving
- *Multitasking is a way of life*, and could also be a response to information overload
- *Staying connected is essential*, real-time dialogues happen from anywhere using any device
- *There is no tolerance for delays*, with expectations for 24/7 services with immediate responses in a variety of modes
- *Consumer and creator are blurring*, with the expectation that if something is digital it is everyone's property

With these attitudes, Millennials often view the use of technology in school as inadequate and perceive themselves as more Internet savvy than their instructors. "The aging infrastructure and the lecture tradition of colleges and universities may not meet the expectations of students raised on the Internet and interactive games" (p. 44).

Campuses across the CSU will be challenged to prepare themselves for the different needs and expectations of this and future groups of students. As Oblinger cautions, "For today's learners, customer service is an expectation, not an exception. Yet it is rare that students and institutions have the same expectations for service" (2003, p. 42).

3.2 Who are Millennial Faculty?

Although campuses are working to provide the services and infrastructure to meet the needs of the Millennial students, John O'Brien (2006) cautions that campuses also need to prepare for the changing needs of faculty. Many faculty members already have increasing technology needs, and a wave of Millennial faculty will be ready for hiring about the same time that campuses can expect a wave of retirements. As explained in the context of Millennial students, many current and incoming faculty have different expectations around technology, rules and policy, and community involvement, and it will be up to the campuses to support these faculty in these areas.

In terms of technology infrastructure, O'Brien (2006) suggests that faculty will insist on more functionality, more interoperability and more innovation. Next generation faculty accustomed to e-commerce models such as Amazon.com will expect identity management, single sign-on, and highly interactive functionality. They will want standards-based systems that can be customized to integrate and "play well" with other systems. Along with ubiquitous wireless connectivity, they will want flexible teaching environments with specialized hardware and software that can accommodate their dynamic teaching needs. As the campus-wide infrastructure improves, and faculty become more tech-savvy, their desires for hardware, software, and services will continue to grow.

New expectations for high service levels mean that faculty are beginning to request more clarity around rules and policies. O'Brien contends that Millennial faculty respect and expect clearly stated ground-rules, since " rules make achievement possible, and reaching goals is important to this generation" (p. 2). Millennial faculty will want to participate in shared governance and consultative decision making, so O'Brien recommends universities:

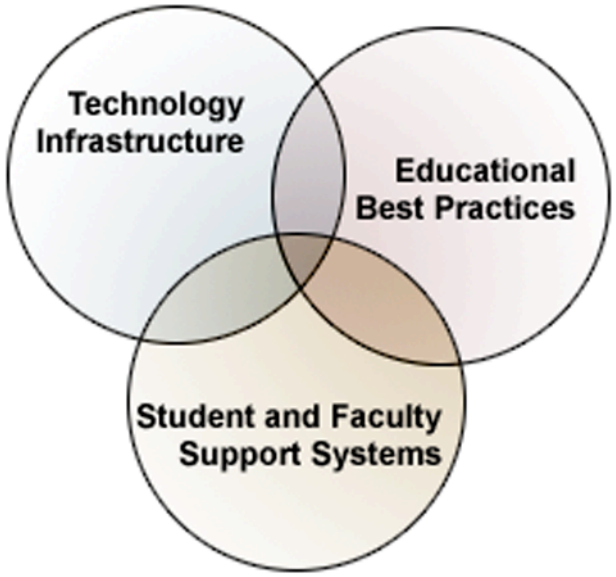
- Develop clear intellectual property policies with respect to eLearning materials
- Compile a faculty handbook to define roles and responsibilities
- Clarify decision-making processes and procedures, and
- Consider implementing a shared model for technology governance.

Finally, O'Brien emphasizes the exciting possibility this generation will present in terms of initiating and investing in community involvement. Campuses working to integrate service learning outreach across the curriculum will impress faculty, since they want to see academic knowledge making a difference locally and globally.

Campus organizations are historically slow to change, yet current and future generations of learners and instructors who are accustomed to more rapid social and technological advances will grow impatient waiting for campuses to restructure themselves to provide the services and infrastructure to support their new needs. It is important to create "a campus infrastructure, organization and culture that will welcome and retain the next generation of faculty and see them thrive" (O'Brien, p. 3).

3.3 How Can We Best Support Faculty & Students?

Exemplary implementations of academic technology initiatives at post-secondary institutions dedicate appropriate attention and resources to three intersecting elements:



- *Educational Best Practices*: Demonstrates best teaching and learning practices from an educational planning and assessment perspective. Integrates universal design for learning principles to ensure accessibility for all.
- *Student and Faculty Support Systems*: Offers comprehensive and tailored, pedagogical and technical support for faculty and students as they develop the technical and cognitive skills associated with assigning and creating media-rich ePortfolios. Includes training, resources, consultations, and help desk support.

- *Technology Infrastructure*: Provides a reliable, scalable, and robust technological solution for creating, hosting, and archiving ePortfolios. System integrates with, and extends, the current campus technological environment.

Many universities within the CSU system have traditionally supported students and faculty in their use of academic technology through several distributed service units, each with discrete mandates and target audiences with respect to teaching, learning, and technical skills development.

An integrated support model for academic technology, therefore, presents an interesting dilemma, since it requires the university to rethink two assumptions associated with more traditional methods of instruction: that faculty can be supported independently from the students they teach, and that technical skills can be developed in isolation from cognitive skills.

Indeed, faculty are best supported when their students are supported, so they are free to focus on the art of teaching and research. Furthermore, it is in the physical, and what some refer to as technical, act of creating and assembling digital artifacts, or interacting in online discussions, that deep reflection occurs and new cognitive levels can be reached.

In the case of academic technology, faculty and students are best served by a collaborative and integrated service model, in which administrative lines between service units are invisible to the end user, with services provided based on the need of the individual, rather than the historic mandate of the unit.

3.4 General trend moving towards enterprise information systems in academic technology

While there have been many discussions around the benefits of centralized or decentralized support of IT in higher education, we believe that academic technology does not require an either / or answer, but rather academic technology services must follow both decentralized and centralized support based on the most effective combination to support innovation in a cost-efficient manner. "In universities, innovation is generally the advancement of the academic enterprise, and it is largely the responsibility of the faculty as supported by the administration" (ECAR Research Bulletin "Recasting the Centralization – Decentralization Debate", May 2008).

Academic technology must support this continuum, spanning decentralized tools and support as well as centralized tools and support. In general, new technology tools come in as standalone systems without full features, but these tools support innovation at the local level. Over time, these immature tools, or combinations of tools, morph into more mature systems that can support the entire university – they become enterprise-class. One of the key responsibilities of an academic technology organization is recognize how best to provide support for different technologies along the centralized – decentralized continuum. The chosen strategy to provide the right support will change over time, as certain tools mature, other tools disappear, and new tools appear.

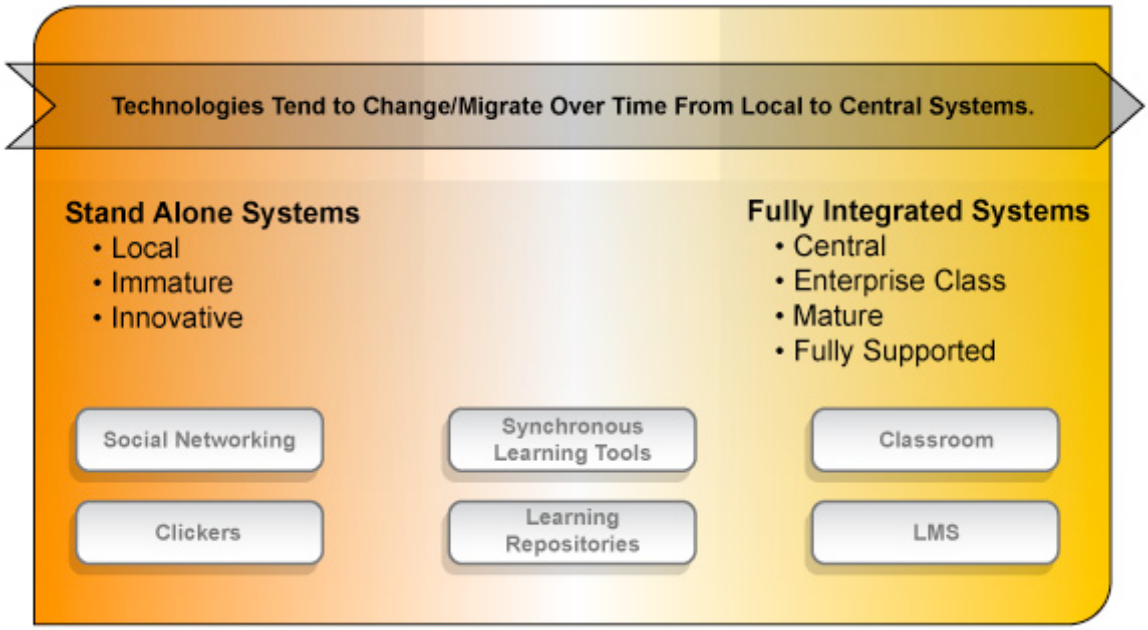


Figure 2 - Academic Technology Continuum going from standalone tools to fully integrated systems

While academic technology must provide a continuum of support, it is only recently that enterprise-class academic applications have emerged. IT professionals in higher education have managed the selection, implementation, and operation of a variety of enterprise-wide systems (e.g., Common Management System) over the last ten to fifteen years, but only in the last five or so years have academic technology systems taken on the characteristics of enterprise IT systems. While much of what campuses have learned in the selection, implementation, and operation of other enterprise IT systems can inform the selection, implementation, and operation of academic technology systems, some challenges are unique to academic technology systems. The key academic technology characteristics for enterprise systems are:

- In contrast to less mature but innovative tools under the control of individual departments or colleges, today's enterprise systems are integrated, horizontal applications where the true value is not achieved without the integration between systems. The applications themselves often serve broad constituencies. The net result is that today's enterprise systems do not fit neatly within existing functional silos.
- Enterprise IT systems are typically "mission-critical." Typically, higher education organizations have a few large systems without which they simply cannot function. By their nature, these systems become the sole means of doing business in a very broad arena within the organization.
- Due to the evolution to mission-critical systems, the typical vendor organization has had to change to support this new model. Vendors have changed from small-company research groups into emerging enterprise organizations, whether by organic growth or by corporate acquisitions. Vendors are required to provide full support for their products, and the products are judged on how stable the companies are. One effect of this transition is the significant rise in license fees, often costing tens or hundreds of thousands of dollars per year for academic technology systems.
- Because enterprise IT systems are so broad and so critical, decisions concerning the system are typically made by some process that involves a wide range of participants. When many universities adopted their first centrally supported Learning Management System (LMS) in the

late 1990's, the decision was made by a few mid-level managers from central IT. Today, the selection of an enterprise system requires participation by scores of individuals including leaders at the highest level.

Obviously, not all institutions of higher education are at the same level of enterprise adoption for e-learning. The recent trend is moving academic technology into the enterprise world, which is creating a dichotomy where the enterprise applications are often supported centrally while the end user training and support for new tools may be decentralized.

3.5 General trend moving towards interactive technologies

At the same time that our industry is moving towards enterprise systems and support within academic technology, there is a parallel movement towards interactive technologies, which might be classified as "Web 2.0". These tools focus on the interaction between faculty and students, between students and other students, and even with people outside of the classroom. These tools have significant implications on the pedagogical design of the course and move beyond the traditional content delivery and assessment model historically predominant on campus.

These technologies, however, are innovative and somewhat immature. In other words, many of these tools are not yet enterprise-level and typically fall in the local side of the spectrum described above. While these technologies may be appealing to some faculty and students, they do not diminish the importance of and demand for central, enterprise systems. However, we should expect a convergence over time as these interactive technologies mature and become part of the enterprise system.

3.6 Accessible Technology Initiative

The Accessible Technology Initiative (ATI) reflects the California State University's (CSU) ongoing commitment to provide access to information resources and technologies to individuals with disabilities. This commitment is articulated in Executive Order 926 (EO 926), the CSU Board of Trustees Policy on Disability Support and Accommodations:

"It is the policy of the CSU to make information technology resources and services accessible to all CSU students, faculty, staff, and the general public regardless of disability."

It is our assumption that everything in academic technology is supporting the Accessible Technology initiative. The Accessible Technology Initiative is a perfect example needing all three elements of academic technology: 1) technology that gives faculty the tools, 2) educational best practices that provide examples of how to use the tools to make curriculum accessible, and 3) support structures that provide faculty training and troubleshooting. In order to achieve the "Mandate: **Fall Term, 2012**: Instructional materials and instructional websites for all course offerings will be accessible," it will require a collaborative effort amongst the technical staff, instructional designers and the faculty. The challenges are: 1) no incentive is provided to faculty to re-create or edit their semester's or quarter's course materials to make them accessible, 2) no resources (people or money) were made available for investigating, training, or purchasing products that help make materials accessible (like captioning software).

3.7 What is Academic Technology Governance?

In their article, Rethinking Academic Technology in an Era of Change, Albright and Nworie (2008) explain that universities across North America have created centralized academic technology units in response to the rapidly evolving and changing field of instructional technology. The introduction of Internet-based technologies over the last two decades has revolutionized the way that students and faculty gain access to information and deliver instruction, transforming significantly the campus infrastructure for supporting learning technologies.

Looking back over the years, academic technology has emerged as an administrative unit to house the various manifestations of the more localized fields of visual instruction, audiovisual instruction, audiovisual communications, and, eventually, what has come to be known as instructional technology. Instructional technology, as a common name for the field, still persists and definitions "emphasize the basic processes of teaching and learning and the instructional contexts in which information is used" (Albright & Nworie, 2008, p. 18). The field of instructional technology encompasses the information itself and how it is designed and developed to maximize its educational effectiveness. It is grounded in theories of learning and communication, and is concerned with helping students achieve learning outcomes. "It is a broad field that has the potential to touch virtually every element of teaching and learning at every higher education institution" (Albright & Nworie, 2008, p. 118), so it extends well beyond learning management systems and smart classrooms.

As DeBois (2006) states, the changing roles of librarian, media specialist, information resource analyst, faculty computing consultant, instructional technologist, and instructional designer, have created unique service, management, and leadership challenges. Many of the units that provide the services in support instructional technology have emerged in separate, disconnected areas of the university, making it difficult to provide coordinated, integrated, and holistic support for effective learning and teaching with technology.

Albright and Nworie (2008) recommend establishing

> *a senior academic technology officer* (SATO) to provide strategic leadership and direction for academic technology applications, initiatives, and support services across the broad spectrum of technology functions; provide leadership in planning and policy related to curriculum development, e-learning, and other instructional technology initiatives that facilitate achievement of the institution's strategic goals; and build partnerships among campus academic support units to work collaboratively toward achievement of institutional goals that can be addressed through instructional technology.

With the role in place, academic technology units offer the promise of campus partnerships with other academic support organizations that could focus on themes such as improving access to resources for scholarship, facilitating communities of learners, assessing learning, coordinating professional development programming for faculty, planning for academic technology and distance learning, identifying and promoting best practices related to teaching and learning, particularly technology-based learning, and aligning technology with pedagogy (Albright & Nworie, 2008, p. 17).

3.8 How Can We Best Manage Our Academic Technology Resources?

Academic technology describes the use of technology to either enhance face-to-face learning, or deliver instruction through hybrid or purely online environments. It puts an emphasis on the use of costly technologies and, therefore, depends on the use of careful planning and managerial approaches even more than other instructional support departments. Academic technology is an emerging discipline unto itself, which merges best practices from industry, with respect to the design of software and development processes, and academia, with respect to the design of instructional activities and learning spaces. Academic technology blends the virtual and physical, as well as the industrial and educational.

Research in the field of academic technology overwhelmingly indicates that a project management approach is essential for the development of high quality, cost-effective, and sustainable courses and programs (Bates, 2000). In their article, The Myth About Online Course Development: "A Faculty Member Can Individually Develop and Deliver an Effective Online Course" Oblinger and Hawkins (2006) call attention to the fact that instructional development models have changed from what Bates (2000) describes as the "Lone Ranger" approach. "Developing and delivering effective online courses requires pedagogy and technology expertise possessed by few faculty" (Oblinger, 2006, p. 14), and a team-based, project management approach allows faculty members, and other valuable university resources, to contribute in the most effective, and fiscally responsible ways.

Although the IT industry has long used project management methodologies to develop stable technological solutions and ensure a high return on investment, academic institutions have been slower to adopt these practices. This delay can be attributed to a lack of training in these processes for leaders who have traditionally emerged from faculty positions or reluctance by these former faculty to adopt formalized structures that may be perceived as a threat to their rights to academic freedom and exploration (Bullen, 2006). Nonetheless, project management approaches have been found to provide even more opportunities for academic satisfaction since they allow for proper planning of resources, leading to more successful project outcomes.

Although most academic technology units across the CSU do not use formal project management methodologies, increasing demands on limited resources, as well as increasing collaborations across different units within each campus, indicate that more formal project management procedures across the CSU can bring more clarity for funding, project prioritization, roles and responsibilities, and accountability.

4. Academic Technology Baseline Definition

In 1996, the California State University system defined the ITS Baseline, including the use of a pyramid to show how technology and services build on each other to lead to the desired outcomes. Likewise, academic technology has key infrastructure needs that all programs and initiatives build upon to lead to academic outcomes.

Given the expanding scope of usage for academic technology, we need to describe the key components of academic technology that are needed to support the academic mission. The current baselines as well as the stretch baselines (where the campuses should be at in 3 to 5 years) will also be identified.

Where does learning in the university take place today? Everywhere really, but most specifically, faculty and students are engaged in the formal process of teaching and learning in university classrooms, labs and in virtual learning environments. The LMS is accessible from a web browser and allows faculty the tools to manage their courses and provide online course activities for the students. Classrooms, labs and the LMS form the basis of today's instructional environment and are at the base of the university's academic technology infrastructure.

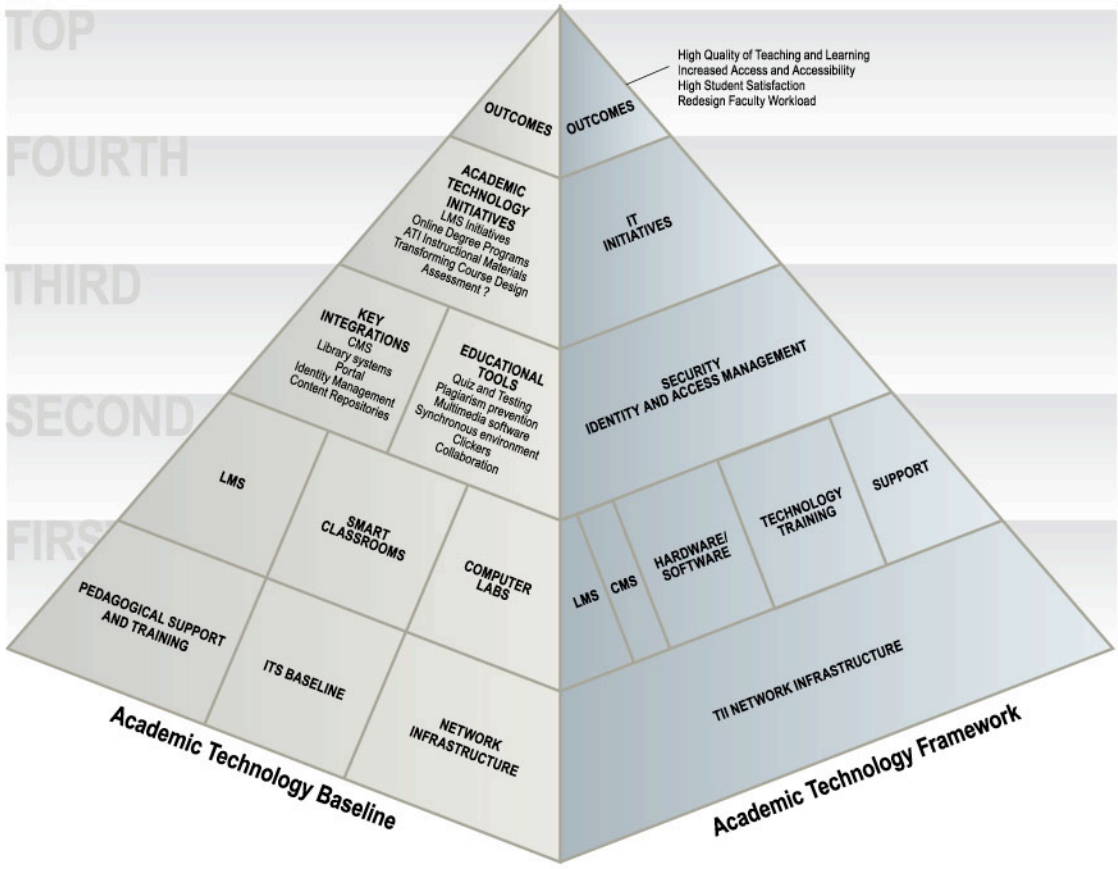


Figure 3 - Academic Technology Pyramid includes the Baseline and Framework

As stated earlier, academic technology consists of three elements: the technology itself, the educational practice or pedagogy, and their support structures. To ensure the successful implementation of a core technology, it is critical to address how each of the elements will support the technology.

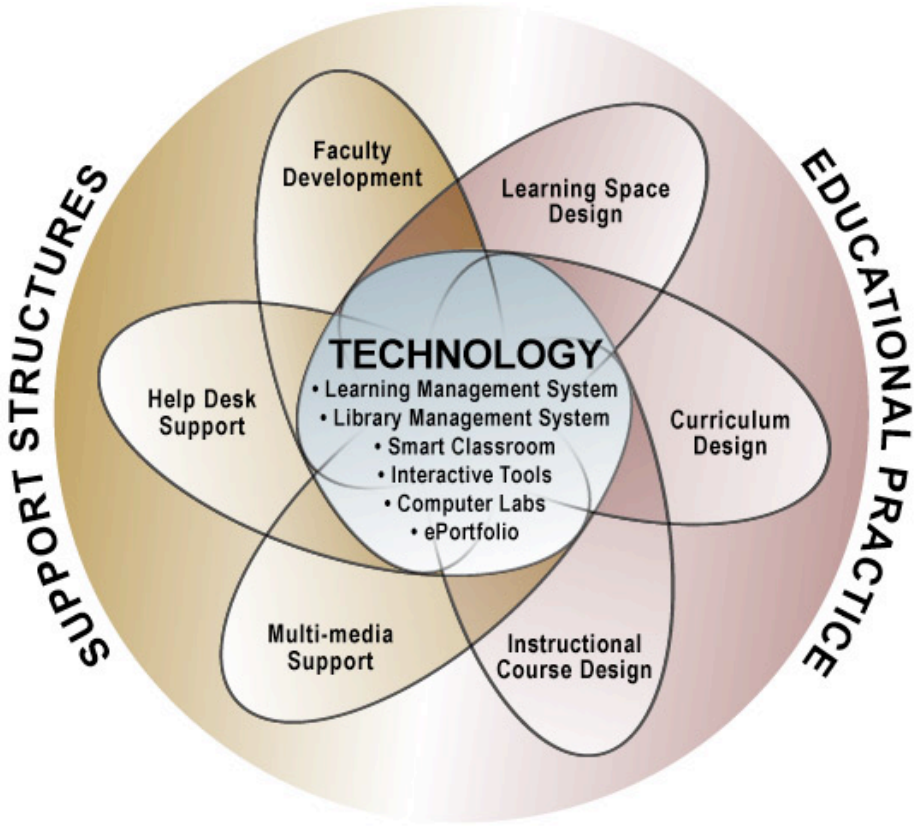


Figure 4 - Academic Technology Elements include Educational Practice, Support Structures, and Technology

FROM 2003 ATPC REPORT FROM THE CHANCELLOR'S OFFICE

> Academic technology offers the opportunity to explore learning transformations that change the relationships between teacher and learner and content. It will, in time, allow for the creation of environments in which teachers can present content in different ways designed to appeal to the diversity of student learning styles. But first, we must better understand how these considerations impact the physical and virtual environment within which we teach. This Focus Area would support innovative projects designed to better understand the relation between content, pedagogy, and learning systems, on the one hand and physical and virtual learning environments, on the other. It will also support projects that disseminate the knowledge and experience gained across disciplines and CSU campuses.

It is for these reasons that the overarching items of pedagogical support, training, and technical support need to be addressed as part of the Academic Technology Baseline regardless of the tool or technology.

4.1 Educational Practice - Curriculum Design

Effective academic technology has to start from the pedagogical perspective – the very mission of academic technology within California State University system is to support effective learning environments. Technology is a means to an end. Traditionally, the training and support services for academic technology have been fragmented, with pedagogical support and training separate from technology support and training. Faculty has focused on their roles as developers and overseers of curriculum and instruction as well as researchers. Its increasing importance in most aspects of higher education including technology in teaching and learning and in research has necessitated new strategies to realign values, perceptions, and expectations between two cultures. To be effective, these services must be closely coordinated, and all technology decisions – which technologies to employ and how to employ them – should start from the pedagogical needs being addressed by the technology.

4.1.1 Coordination with Faculty Development Center

Current Baseline: All campuses should have a structure or organization to provide faculty with instructional technology/designer support. In other words, there must be training that includes assistance with pedagogical design and instructional technology support. This combined organization or coordinated program should provide faculty recognition, mentoring programs, follow-up training sessions, and access to shared resources.

Recognizing the importance of "bridging the divide" between pedagogy and technology, Ives and Steinbrenner (2005) called for combining faculty centers and instructional technology support as a new approach to supporting faculty who use technology. Increased numbers of academic technology staff members with degrees in Instructional Technologies or Educational Technologies provide opportunities to overcome perceived barriers related to role specificity in the two types of center. In 2005, CSU Fresno merged both faculty development and academic technology into the Office of Teaching, Learning and Technology.

Combined academic technology centers, or collaborative teams that include faculty and staff from both academic technology and faculty development centers, should take a leadership role in training faculty to use technology in the teaching and learning process. As one of their tasks, the centers should be involved in the needs assessment, planning, development, delivery and evaluation of workshops. A strong emphasis should be placed on teaching, research and service as the drivers for technology use. "Before the correct technology can be selected for a course, the pedagogical consequences must be considered" (Laughner, 2003). Faculty developers from all campus units must be ready to tell faculty that not all technology is appropriate for students' instructional needs.

It has been demonstrated that technology can be used to facilitate good teaching and learning practices. It would be reasonable to expect that faculty development programs would support faculty in the use of new learning technologies. With the learning environment changing so drastically, it is critical that professional development programs support faculty in this transition.

FACULTY RECOGNITION AND SHARING OF BEST PRACTICES

Academic technology must successfully straddle the IT environment and the academic environment. This requires a very good understanding of the academic side of the house as well as effective and efficient pedagogical use of technology.

One of the best ways to encourage and support faculty in the wise pedagogical use of technology is to make pedagogical models visible to other faculty and recognize those that have innovatively and successfully implemented technology into their face-to-face and online instruction. This recognition can come in many ways, featuring them in a campus newsletter describing their use of technology in their courses, asking them to present at a faculty Technology in Learning and Teaching session or asking them to nominate themselves for Exemplary Online Instruction to be recognized amongst their peers for implementing their online instruction according to a campus rubric.

Faculty training may include workshops, peer-led presentations and communication, and personal consultation with instructional designers. Training encourages discussion of pedagogical issues, models and strategies, and facilitates teamwork between faculty participants, instructional designers, and the production team to produce the actual course materials.

4.2 Educational Practice - Learning Space Design

Current Baseline: Through a Physical Planning project manager, faculty, instructional designers, and technology service providers should meet in the initial stages of planning or remodeling a classroom to ensure needs are effectively addressed. As the needs and requests for learning spaces change, the instructional designers and technology providers need a forum to suggest modifications based on end user requirements and academic technology needs.

Current Baseline: Documentation should be available both electronically and in the room for all equipment, so that users can determine what equipment is available and how to use it. Appropriate documentation will be provided simultaneously with equipment upgrades. Documentation will be clear, simple, and accessible in design. Visual "Quick Start" guides will be available as job aids in the room. User assistance, including technical support, will be available wherever classrooms are in normal instructional use. Response time should not exceed 15 minutes. AT staff will provide training, consultation, trouble call response, and other appropriate support for faculty who are using Smart classrooms. They will also provide routine checks and maintenance of the rooms. College and staffing should be maintained at sufficient levels to enable meeting the standards.

Current Baseline: All Smart Classroom equipment will be designed and installed in such a way that it is consistent with the scale of the room and in keeping with the appropriate technology and aesthetic design standards.

According to "Trends in Learning Space Design", (Brown & Long, 2006) the authors suggest that advances in understating how students learn, coupled with increasing demands on student time, have "led to rethinking the use, design, and location of learning spaces". Three major trends in learning spaces are:

- Design based on learning principles, resulting in intentional support for social and active learning strategies
- An emphasis on human-centered design
- Increasing ownership of diverse devices that enrich learning

Collaboration, interaction, and instant access to the internet are essential for 21st century learning in both bricks and mortar (or face-to-face) and virtual spaces; it is mission critical for the CSU to provide technology to enable these activities. Academic technology solutions must be scalable, sustainable and fit within the university's overall architecture. While every CSU campus has smart classrooms, we need to focus on ensuring the broad availability and support of these classrooms to allow true academic transformation and usage of appropriate teaching and learning technology.

"Smart" classrooms are in high demand by faculty across the CSU. The university learning spaces are the heart of where formal learning and teaching takes place for the faculty and majority of our students, and changing student demographics and new academic technologies to support learning and teaching are creating the need for redesigned classrooms. Hence, it is important that CSU campuses keep these learning spaces up to date, consistent, and readily available to access online content and mediated resources used in contemporary curriculum.

Academic technology services include creating the environment to enable the exploration and usage of smart classrooms for each campus. Successful programs are designed to give faculty and students access to a flexible, high-tech learning space, and provide comprehensive faculty development and hands-on support when teaching in the smart classrooms. It is essential for academic technology organizations to devote time and resources to on-going exploration and evaluation of emerging technologies to drive technology decisions campus-wide. Instead of deploying "one-size-fits-all" smart classrooms, the goal should be to map teaching pedagogies to specific technologies that enhance student-learning outcomes. The intent is for future technology-enhanced classroom build outs to be informed by use cases by the programs.

4.3 Educational Practice - Instructional Course Design

Current Baseline: All campuses should make the Rubric for Online Instruction available for Instructional Designers and faculty or use an equivalent tool.

Stretch Baseline: All campuses must have instructional technologists/designers working closely with faculty to connect the programs to the learning outcomes. **A ratio of one instructional technologist to each 100 faculty is suggested.**

Current Baseline: The academic technology consultants should work closely with faculty and staff to connect the programs to the learning outcomes.

Academic technology consultants should be available to help faculty and staff maximize their use of the technology to support learning. The consultants are available to create courses, develop multimedia, troubleshoot problems, and revise and transform courses. Adequate support such as instructional designers, programmers, writers/editors, and graphic artists should be available. Instructional design may take on many different levels of support such as training, project management, and pedagogical assistance.

According to the Informational Technology Funding Gap Study, it is important to have adequate resources available to support the faculty.

Help desks can provide answers to technology questions or issues but typically do not have expertise in teaching and learning design. Instructional designers are skilled staff who understand the theories of teaching and learning and understand best practices such as "Seven Principles of Good Practice in Undergraduate Education" (Chickering & Gamson, 1987).

As more instruction is put online, the gap between understanding the technology and applying it to the teaching and learning environment is filled by instructional designers. That means that more instructional designers are necessary to fill in the gap particularly as faculty are asked to strategize handling more students in their classes. As a team, faculty and instructional designers can create effective models for learning and teaching that can be used across the institution and not just in one course here or there. Curriculum resources and implementation can be duplicated in the LMS or digitally as appropriate.

Faculty are busy. Typically, they have worked by themselves to design their instruction; however, they can't be expected to stay current with all the technological innovations. Their expertise is and should remain in what they are trying to pedagogically achieve in their class and in defining student learning objectives. So an Instructional Designer who has the experience of designing instruction and knows the technology, is meant to provide the faculty with ideas and methods for innovative online instructional activities knowing the tools that the institution has available to the faculty and students.

Accessibility is an important area that provides a great example for combining the expertise of the instructional designer and the faculty. Faculty do not have time to discover what tools they can and should be using to make their instructional materials accessible. Instructional designers have found the short cuts and can assist faculty in using the right tool for the job, whether it be a PowerPoint that needs to become accessible or a Syllabus in a Word document?

Instructional designers are in high demand at those campuses where the online momentum is building. New faculty who are looking for assistance in designing their instructional materials and faculty who are looking to improve their online instruction are looking to instructional designers for assistance. Again, in a time where we are asking faculty to do more with less, this teamwork is invaluable to higher education institutions today.

While faculty want to be trained 'Just in Time' (JIT) to address their specific pedagogical and course designs, there are not enough staff to provide that kind of support. Staff are therefore looking for ways to use the technology to get faculty answers to the questions using online instruction, Knowledge bases, flash tutorials, streaming media and screen captures.

The expectations of students learning online are rising while the tenured faculty might not see the value in offering course materials and activities online. There is a gap between what tenured faculty feel they need to deliver and what today's students want available.

A majority of faculty teaching today never took an online course. So naturally, those faculty ask the question "What is good online teaching? What does it look like? How does it work?" CSU Chico faculty and staff created a Rubric for Online Instruction (ROI) which provides faculty a set of indicators to determine a baseline, effective or exemplary level of instruction in these categories 1) Learner Support and Resources, 2) Online organization and design, 3) Instructional Design and Delivery, 4) Assessment and Evaluation of Student Learning, 5) Innovative Teaching with Technology and 6) Faculty Use of Student Feedback. Faculty use this rubric when they begin to put their course online and/or can use it to review their course. This rubric has been adopted by 79 higher education institutions around the world. The ROI closely aligns with the "Seven Principles of Good Practice in Undergraduate Education" (Chickering & Gamson, 1987). A rubric can assist faculty in designing their online course providing multiple methods for learners to engage in the curriculum. Providing student learning objectives and aligning assessment activities with those learning objectives keeps the students focused and time spent on task.

4.4 Support Structures - Faculty Training

Current Baseline: All campuses should establish a unit that provides instructional technology, and instructional design, support and services to faculty to integrate technology effectively in the teaching and learning process.

Current Baseline: All campuses must create a training strategy in order to consistently and equitably provide ongoing professional development.

Current Baseline: All campuses must create a training strategy in order to consistently and equitably provide ongoing professional development for technical staff so they can provide improved support to users

Current Baseline: All campus Directors of Academic Technology (DATs) must make an effort to tie technology to pedagogy.

Current Baseline: All campus training programs must be created to ensure IT users and providers can effectively use the technology that is available through each campus.

Current Baseline: All campuses must provide orientation training on all of the teaching tools that are available to them.

Current Baseline: All campuses must provide an Introduction to Academic Technology.

Current Baseline: All campuses must train faculty in all aspects of pedagogy.

Current Baseline: All campuses should share Best Practices

All campuses must provide technical training for faculty, staff, and students in order to ensure they have the skills and resources to effectively utilize technology. Training needs to be available in a variety of delivery methods to suit the situation. It is critical to work with the faculty to find out what training would work for them. Just providing a workshop is not enough.

Many professional development methods are antiquated and rely solely on people attending face-to-face workshops. Technical professional development programs should be available in a variety of methods such as face-to-face training sessions, printed materials and online synchronous and asynchronous sessions.

4.5 Support Structures - Help Desk Support

Current Baseline: Technical Support programs and Service Level Agreements (SLAs) must be created to ensure IT users (faculty, staff, and students) and providers can effectively use the technology that is available through the university. A Help Desk should be created to assist the users.

Current Baseline: Anytime/Anywhere Access - All users should be able to access the Help Desk by phone or online through a Contact Us link or Technical Support page.

Current Baseline: System Status - All users should be able to access a Systems Status page that identifies the status of key campus wide system (up, down, planned outages, expected time for the system to be available) as well as planned maintenance windows.

Current Baseline: Password Reminder / Reset - All users should be able to access a Password Reminder / Reset feature on the Help Desk Home page.

Current Baseline: Quick Start Guides - Accessible "Quick Start" guides will be available as part of the FAQ section on the Technical Support page.

Current Baseline: All campuses must define their Help Desk Support and the SLAs around it. They must identify what is covered and how it is covered (phone, email, contact us, or walk up)

Current Baseline: Each campus should be making data driven decisions to change/expand their support hours.

Current Baseline: 8am to 8 pm full support level (to cover majority of classes)

Stretch Baseline: Full Level 1 support will be available 24 x 7, within 3 years.

Stretch Baseline: Faculty do a lot of their work outside of the regular hours of 8am to 5pm. There is a growing demand to support them outside of the normal business hours.

Stretch Baseline: All campuses will have a fully functioning knowledgebase/FAQs in place or some other method to capture and share knowledge of campus systems. This should provide the capability to develop a knowledgebase for use by students, faculty, and staff to address questions that they may have. Students, faculty, and staff will be able to search the knowledgebase, find information about their problem and submit questions if they cannot find a resolution. A process for publication and review of FAQs must also be inherent in the system.

4.5.1 Help Desk

The Help Desk support should consist of the following support levels:

- Level 1 Support

  Level 1 Support is the first place that a student, faculty, or staff member goes to get assistance, whether for password problems or deeper technical issues. Level 1 Support either resolves or escalates the issues, providing a quick first response to a user's issues.

- Level 2 Support

  Level 2 Support consists of more experienced staff that are available to resolve issues and do more advanced troubleshooting based on triage from Level 1 Support. They are the group that receives escalations from Level 1.

4.5.2 Service Level Agreements (SLA)

A service-level agreement (SLA) is a contract between a provider (the university) and a customer (faculty, staff, and students) that specifies, usually in measurable terms, what services the provider will furnish. Many providers provide their customers with an SLA. More recently, IT departments in many institutions have adopted the idea of writing a SLA so that services for their customers (users in other departments within the enterprise) can be measured, justified, and perhaps compared.

For example, the academic technology unit at San Francisco State University created an SLA for its LMS, which documents the following:

- The services provided by the LMS to the SF State campus community
- The general levels of response, availability, and maintenance associated with these services
- The responsibilities of academic technology as a provider of these services
- The responsibilities of the LMS users receiving these services
- The processes for requesting services from the academic technology unit

4.5.3 Knowledge base / Self Service

The knowledgebase is where faculty, staff, and students look for an answer to a question without contacting a person. They should have the ability to "help themselves" resolve a problem or review Frequently Asked Questions (FAQs). If they cannot find what they are looking for then they should contact the Help Desk.

Current CSU examples of knowledge bases include CSU Chico's Vista LMS Knowledge Base (http://www.csuchico.edu/tlp/lms/kb/) and the Community of Academic Technology Staff (CATS) Knowledge Base generated by staff from all twenty-three campuses (http://cats.cdl.edu/knowledge-base).

4.6 Support Structures - Multi-Media Design

Current Baseline: Campuses must have access to the Center for Alternative Media to determine if textbooks and course materials already exist in alternative formats. If not, the alternative format needs to be created or obtained. This may require additional funds for hardware, software, staffing, or contracts with service providers.

Current Baseline: Campuses need to have training and/or tutorials available to faculty to assist them in editing or creating accessible materials and making them available in the LMS or some other digital repository.

Current Baseline: All media (DVDs, podcasts, streaming media), whether purchased or created on campus must be captioned or made available in another format.

4.7 Technology - Learning Management System (LMS)

Current Baseline: All campuses should be able to be configured for 24 x 7 access to learning content and administration by students and faculty excluding planned maintenance windows. System backup are not considered planned maintenance and the system must be available during all backup processes.

Current Baseline: In these times of stretched resources, it is recommended that each campus has one LMS and multiple LMS installations are discouraged.

Current Baseline: Automatic population - All campuses should support an automatic population of courses, faculty, and students into the CMS.

Current Baseline: Roster Integration - All campuses should support roster integration between the CMS and the LMS. This integration includes automatic roster updates on a daily basis with adds / drops supported.

Stretch Baseline: Final Grade Integration – All campuses should support final grade integration between the LMS and the CMS.

Stretch Baseline: All campuses should support, within 2 years, event-driven roster and final grade updates within 2 hours.

The commercial market for LMS solutions in higher education is less than ten years old. In that short time this market has changed from department-wide systems to institution-wide systems. As a result, many systems and support structures have not been "enterprise" systems until recently, and the associated costs for supporting an LMS have grown exponentially.

It is difficult for both vendors and campuses to handle the incredible growth of managing these systems. No other system on campus has so many users expecting the system to be up all the time; potentially all students and all faculty using it every day and many hours out of the day. Accordingly, academic technology organizations must change how they manage the LMS systems on campus.

A good LMS produces a practical environment in which learners can find the content and activities they need, and instructors can evaluate student performance and their own teaching effectiveness. Faculty and campus staff members have begun using the LMS for committee work, managing grant and research projects, and conducting professional training. What good is the LMS if it does not meet the needs of all of these people? One of the key factors in finding the right LMS is matching it to teaching and learning requirements, not the other way around. For this reason, among others, it becomes essential to document effective teaching and learning requirements and use-case scenarios that describe exactly what is needed and then included in a request for proposal (RFP).

The learning strategy defines the objectives and the learning organization's alignment to those objectives. At the heart of the learning strategy is defining how the learning organization would achieve the objectives; in other words, the actions that need to be taken, and the processes to be executed to accomplish the objectives.

For the purpose of this document, we are not defining the requirements of an LMS because they have been defined in the LMS RFP initiative but we will describe the attributes.

The CSU has an Identity Access Management (IAM) program in place that establishes authentication, identity management, and unique access. Each campus should be following the program when setting up access to the LMS.

4.8 Technology - Smart Classrooms

Current Baseline: Minimum setup for any classroom serving more than 10 students should contain the following:

- Access to a computer
- Internet/network access
- Flash drive capacity (USB)
- Projection
- Sound system
- Audio
- Video
- Single control system
- Tools for interactive capture
- Adequate large screen displays
- Telephone (on-campus line available within arm's reach of podium)
- Projectors supporting HD

Stretch Baseline: The CSU should be striving for:

- Tools for content/interactivity capture
- Remote control
- Tools for tech support
- Secured video-data projector with at least 1024 x 768 resolution
- Wall-mounted screen
- Audio amplifier & Speakers
- Lighting controls (within arm's reach of podium)
- Single control system that allows for intuitive switching of sources between output on the projector and internal display. The control system will be capable of Web-based monitoring and remote control.
- Public address system with wired and wireless microphone (based on the number of seats and acoustics of the room)
- Synchronous communication tools or Videoconferencing
- Smartboards
- Clickers to poll students and prompt discussions
- Ceiling-mounted document camera
- Projectors and screens supporting widescreen format and super-stretch

The major purpose of the university is to provide educational opportunities for learners. Students and faculty come together most frequently in the classroom. Presentation and learning technologies have often been a part of classroom design, from chalkboards to Internet access and video projectors. The technologies involved in classroom design change frequently, and so the target is always moving. In this environment of flux, the university should strive to provide classroom environments using technology that promotes active participation, learning, and assessment, and prepares students for the "real world" environments in which they hope to excel.

Because advances in classroom technology evolve so rapidly, this list is only good for the next twelve-months. However, most of the equipment listed below should, on average, have a working life span of no less than three to five years. Therefore, the university should have a defined and funded refresh cycle for the classrooms.

Technology creates a shift from traditional classrooms to innovative learning spaces. In these new learning spaces, Malcolm B. Brown and Joan K. Lippincott's article, "Learning Spaces: More than Meets the Eye", suggest that teaching and learning transcends the boundaries of the traditional classroom. Therefore, these new learning spaces require a paradigm shift and an integrated strategy for technological and faculty support.

4.9 Technology - Interactive Learning Tools

Current Baseline: The following types of interactive tools that should be deployed at the CSU system campuses and made available to all disciplines:

- Quiz generation tools
- Plagiarism prevention tools
- Multimedia software

- Web conferencing or Virtual Classroom
- Clickers (also called student response systems or audience response systems)
- ePortfolio tools, assessment management tools, blogging tools, etc.

Current Baseline: The following synchronous learning tools should be deployed across California State University system campuses and made available to all disciplines:

- Web conferencing tools
- Real-time online learning tool

Current Baseline: All campuses should be configured to support access to the tools while classes are in session excluding planned maintenance windows. System backups are not considered planned maintenance and the system must be available during all backup processes.

Stretch Baseline: All campuses should support teaching and learning with these tools while classes are in session via phone, e-mail, and chat support. Responses to the users must be done within a timely manner.

Interactive tools refer to the tools and resources that are available to support collaborative, student-centered learning and should be available to the faculty to meet their pedagogical needs. The tools can be available through the portal.

Synchronous learning refers to a group of people learning the same things at the same time in the same environment – whether the environment is physical or virtual. This is the type of pedagogy practiced in most schools and undergraduate programs, but not necessarily in graduate programs. With the advent of web conferencing tools, people can learn at the same time in different places as well.

4.10 Technology - Computer Labs

Current Baseline: All campuses must evaluate and deploy a set of deployment tools to provide consistent provisioning of computer images.

Stretch Baseline: All campuses must evaluate and deploy a set of deployment tools to provide consistent provisioning of digital media, including but not limited to high resolution images, audio, video, and multimedia animations.

Current Baseline: In general, any software that is used directly in a course should be available in a general-purpose or discipline-specific computer lab on campus. Campuses should help students with their learning outside of the classroom.

Current Baseline: Labs should be configured to support individual student activities in a supervised environment. Open lab areas contain copies of all academic software used in classroom instruction. Technicians should be available to assist users with class assignments or research.

Stretch Baseline: Additional software and tool that can be included in the lab:

- Blogs
- Wikis
- Podcasting
- Instant messaging technology
- Controllers
- Key Servers

Stretch Baseline: All computer labs will be configured such that:

- Academic technology defines the most commonly used academic software and manages it in computer labs.
- Software licenses are pushed out to labs and patches are automated.
- All hardware is budgeted and refreshed on a 3-year cycle.
- Access to labs outside of the classroom.
- Access to technology and the learning environment where student do their work.

Documentation should be available both electronically and in the room for all equipment, so that users can determine what equipment is available and how to use it. Appropriate documentation will be provided simultaneously with equipment upgrades. Documentation will be clear, simple, and accessible in design. Visual "Quick Start" guides will be available as job aids in the lab.

4.11 Technology - Access to Library Information System (LIS)

Current Baseline: Single Sign-on – LMS to Library Resources. Minimally, integrated authentication between the LMS and core library services like those below will allow the information embedded in the LMS from library systems to be directly accessed without re-authentication.

- Electronic Reserves
- Electronic databases
- Library catalog
- Reciprocal borrowing

Current Baseline: Create Partnerships with the Library and Librarians

- Assist librarians in developing generic library modules to embed in courses to aid faculty in embedding library information into courses
- Working with faculty in specific courses, add a subject matter librarian who can support research projects, help locate electronic resources, and provide direct support to students in individual courses

Current Baseline: All campuses should provide training and support of the LIS.

Current Baseline: Provide documentation and FAQs for the users of the LIS.

The resources provided by libraries support the instructional and academic programs at the CSU. As students and faculty spend more time in the LMS, integrating library resources into courses can enrich the information content of a course and support students via direct access to information.

Most libraries today have multiple systems:

- Electronic reserves
- Library electronic databases
- Library catalog
- Consortium catalog

Technology exists today to improve the integration of library resources, especially where authentication is concerned for access to electronic databases, access to local library catalogs and consortium repositories. However, working to establish a partnership between faculty and librarians at the course level is an important linkage that CSU Directors of Academic Technology could actively pursue. The partnership holds the possibility of improving core student skills in information competency and literacy, writing and research.

4.12 Technology - Content Repository

Current Baseline: The content repository is a general storage area that will assist with the sharing of information. The site should be accessible by faculty and staff.

Current Baseline: Anytime/Anywhere Access - All campuses should be able to be configured for 24 x 7 access to learning content and administration by students and faculty excluding planned maintenance windows. System backups are not considered planned maintenance and the system must be available during all backup processes.

Current Baseline: Unique Access - The CSU has an Identity Access Management (IAM) program in place that establishes authentication, identity management, and unique access. Each campus should be following the program when setting up access to the Content Repository.

Current Baseline: Integration with CMS - All campuses should support integration between the Content Repository, LMS, and the portal.

Current Baseline: All campuses should provide training and support of the content repository. This support would include support for the tool as well as assistance with content creation such as video streaming/multimedia capturing.

Current Baseline: All campuses should provide a content repository to allow sharing and reusing of files across sections, courses, and department.

4.13 Technology - ePortfolio

Current Baseline: Anytime/Anywhere Access - All campuses should be able to be configured for 24 x 7 access to learning content and administration by students and faculty excluding planned maintenance windows. System backups are not considered planned maintenance and the system must be available during all backup processes.

Current Baseline: Unique Access - The CSU has an Identity Access Management (IAM) program in place that establishes authentication, identity management, and unique access. Each campus should be following the program when setting up access to the ePortfolio

Current Baseline: Integration with CMS - All campuses should support integration between the ePortfolio, LMS, and the portal.

Current Baseline: All campuses should provide training and support of the content ePortfolio.

Current Baseline: Students will have a centralized area to store objects, articles, activities, and achievements and share them with faculty, and staff.

The concept, and intended use, of portfolios in higher education are not new. Many universities have long been using some form of paper-based portfolios to assess student work or to use for academic program review.

ePortfolios address a current and emerging need for students to have an environment in which they can collect, select, reflect upon, build, and publish a digital archive of their academic work. These ePortfolios can server multiple purposes within the academic setting. Students can use them to showcase achievements and/or receive feedback and assessment from faculty, peers, potential employers or graduate programs. Universities can use them to collect student work and assessment data for accreditation purposes or recruitment of future students.

ePortfolios are an electronic portfolio that contains a collection of students' multimedia objects. It is an artifact that provides a record of, and reflection on, activities and achievements, and can be accessed differentially for multiple purposes and reviewers. Students can organize, document and share information for assessment, advising, career planning, and academic growth over their collegiate career.

4.14 Assessment

Current Baseline: Each campus should identify a standard set of data and method of gathering it to adequately compare it. Some attributes to be assessed are:

- Number of courses using the LMS
- Number of faculty using the LMS
- Number of students using the LMS
- What LMS tools are used the most? The least?
- Which departments/colleges are using the LMS? What tools are these departments and colleges using?
- What tools are in use
- How many are using each tool
- What is the frequency of use
- What is the value of the tool
- Does it enhance or impede learning
- What is the perceived value of implementation and satisfaction
- What is the value that faculty and students attach to it?
- Importance of the tool
- Entry and exit assessments
- Tools that help track and support the learning outcomes.

Current Baseline: All campuses should perform a separate assessment of all campus help desk and technical support activities. Find where coordination or centralization might A) improve service to users and B) create efficiencies to relieve the workload of our IT staff. This includes a conscious definition of what services should be provided, which common tools and methods are needed, and which organizations should provide these services.

Assessment tools are used to validate that the technology enables students to demonstrate that they are able to meet course, program, and university learning outcomes.

Not all faculty use the LMS but someday most all faculty will be using the LMS to manage their courses and their curriculum. While the LMS systems capture lots of activity happening in the learning environment, there has not been a standard way of collecting the data out of the system.

Appendix A - Current and Stretch Baselines

Following is the list of all current and stretch baselines broken down by area.

A.1 Educational Practice - Curriculum Design

A.1.1 Coordination with Faculty Development Center

Current Baseline: All campuses should have a structure or organization to provide faculty with instructional technology/designer support. In other words, there must be training that includes assistance with pedagogical design and instructional technology support. This combined organization or coordinated program should provide faculty recognition, mentoring programs, follow-up training sessions, and access to shared resources.

A.2 Educational Practice - Learning Space Design

Current Baseline: Through a Physical Planning project manager, faculty, instructional designers, and technology service providers should meet in the initial stages of planning or remodeling a classroom to ensure needs are effectively addressed. As the needs and requests for learning spaces change, the instructional designers and technology providers need a forum to suggest modifications based on end user requirements and academic technology needs.

Current Baseline: Documentation should be available both electronically and in the room for all equipment, so that users can determine what equipment is available and how to use it. Appropriate documentation will be provided simultaneously with equipment upgrades. Documentation will be clear, simple, and accessible in design. Visual "Quick Start" guides will be available as job aids in the room. User assistance, including technical support, will be available wherever classrooms are in normal instructional use. Response time should not exceed 15 minutes. AT staff will provide training, consultation, trouble call response, and other appropriate support for faculty who are using Smart classrooms. They will also provide routine checks and maintenance of the rooms. College and staffing should be maintained at sufficient levels to enable meeting the standards.

Current Baseline: All Smart Classroom equipment will be designed and installed in such a way that it is consistent with the scale of the room and in keeping with the appropriate technology and aesthetic design standards.

A.3 Educational Practice - Instructional Course Design

Current Baseline: All campuses should make the Rubric for Online Instruction available for Instructional Designers and faculty or use an equivalent tool.

Stretch Baseline: All campuses must have instructional technologists/designers working closely with faculty to connect the programs to the learning outcomes. **A ratio of one instructional technologist to each 100 faculty is suggested.**

Current Baseline: The academic technology consultants should work closely with faculty and staff to connect the programs to the learning outcomes.

A.4 Support Structures - Faculty Training

Current Baseline: All campuses should establish a unit that provides instructional technology, and instructional design, support and services to faculty to integrate technology effectively in the teaching and learning process.

Current Baseline: All campuses must create a training strategy in order to consistently and equitably provide ongoing professional development.

Current Baseline: All campuses must create a training strategy in order to consistently and equitably provide ongoing professional development for technical staff so they can provide improved support to users

Current Baseline: All campus Directors of Academic Technology (DATs) must make an effort to tie technology to pedagogy.

Current Baseline: All campus-training programs must be created to ensure IT users and providers can effectively use the technology that is available through each campus.

Current Baseline: All campuses must provide orientation training on all of the teaching tools that are available to them.

Current Baseline: All campuses must provide an Introduction to Academic Technology.

Current Baseline: All campuses must train faculty in all aspects of pedagogy.

Current Baseline: All campuses should share Best Practices

A.5 Support Structures - Help Desk Support

Current Baseline: Technical Support programs and Service Level Agreements (SLAs) must be created to ensure IT users (faculty, staff, and students) and providers can effectively use the technology that is available through the university. A Help Desk should be created to assist the users.

Current Baseline: Anytime/Anywhere Access - All users should be able to access the Help Desk by phone or online through a Contact Us link or Technical Support page.

Current Baseline: System Status - All users should be able to access a Systems Status page that identifies the status of key campus wide system (up, down, planned outages, expected time for the system to be available) as well as planned maintenance windows.

Current Baseline: Password Reminder / Reset - All users should be able to access a Password Reminder / Reset feature on the Help Desk Home page.

Current Baseline: Quick Start Guides - Accessible "Quick Start" guides will be available as part of the FAQ section on the Technical Support page.

Current Baseline: All campuses must define their Help Desk Support and the SLAs around it. They must identify what is covered and how it is covered (phone, email, contact us, or walk up)

Current Baseline: Each campus should be making data driven decisions to change/expand their support hours.

Current Baseline: 8am to 8 pm full support level (to cover majority of classes)

Stretch Baseline: Full Level 1 support will be available 24 x 7, within 3 years.

Stretch Baseline: Faculty do a lot of their work outside of the regular hours of 8am to 5pm. There is a growing demand to support them outside of the normal business hours.

Stretch Baseline: All campuses will have a fully functioning knowledgebase/FAQs in place or some other method to capture and share knowledge of campus systems. This should provide the capability to develop a knowledgebase for use by students, faculty, and staff to address questions that they may have. Students, faculty, and staff will be able to search the knowledgebase, find information about their problem and submit questions if they cannot find a resolution. A process for publication and review of FAQs must also be inherent in the system.

A.6 Support Structures - Multi-Media Design

Current Baseline: Campuses must have access to the Center for Alternative Media to determine if textbooks and course materials already exist in alternative formats. If not, the alternative format needs to be created or obtained. This may require additional funds for hardware, software, staffing, or contracts with service providers.

Current Baseline: Campuses need to have training and/or tutorials available to faculty to assist them in editing or creating accessible materials and making them available in the LMS or some other digital repository.

Current Baseline: All media (DVDs, podcasts, streaming media), whether purchased or created on campus must be captioned or made available in another format.

A.7 Technology - Learning Management System (LMS)

Current Baseline: All campuses should be able to be configured for 24 x 7 access to learning content and administration by students and faculty excluding planned maintenance windows. System backup are not considered planned maintenance and the system must be available during all backup processes.

Current Baseline: In these times of stretched resources, it is recommended that each campus has one LMS and multiple LMS installations are discouraged.

Current Baseline: Automatic population - All campuses should support an automatic population of courses, faculty, and students into the CMS.

Current Baseline: Roster Integration - All campuses should support roster integration between the CMS and the LMS. This integration includes automatic roster updates on a daily basis with adds/drops supported.

Stretch Baseline: Final Grade Integration – All campuses should support final grade integration between the LMS and the CMS.

Stretch Baseline: All campuses should support, within 2 years, event-driven roster and final grade updates within 2 hours.

A.8 Technology - Smart Classrooms

Current Baseline: Minimum setup for any classroom serving more than 10 students should contain the following:

- Access to a computer
- Internet/network access
- Flash drive capacity (USB)
- Projection
- Sound system
- Audio
- Video
- Single control system
- Tools for interactive capture
- Adequate large screen displays
- Telephone (on-campus line available within arm's reach of podium)
- Projectors supporting HD

Stretch Baseline: The CSU should be striving for:

- Tools for content/interactivity capture
- Remote control
- Tools for tech support
- Secured video-data projector with at least 1024 x 768 resolution
- Wall-mounted screen
- Audio amplifier & Speakers
- Lighting controls (within arm's reach of podium)
- Single control system that allows for intuitive switching of sources between output on the projector and internal display. The control system will be capable of Web-based monitoring and remote control.
- Public address system with wired and wireless microphone (based on the number of seats and acoustics of the room)
- Synchronous communication tools or Videoconferencing
- Smartboards
- Clickers to poll students and prompt discussions
- Ceiling-mounted document camera
- Projectors and screens supporting widescreen format and super-stretch

A.9 Technology - Interactive Learning Tools

Current Baseline: The following types of interactive tools that should be deployed at the CSU system campuses and made available to all disciplines:

- Quiz generation tools
- Plagiarism prevention tools
- Multimedia software
- Web conferencing or Virtual Classroom
- Clickers (also called student response systems or audience response systems)
- ePortfolio tools, assessment management tools, blogging tools, etc.

Current Baseline: The following synchronous learning tools should be deployed across California State University system campuses and made available to all disciplines:

- Web conferencing tools
- Real-time online learning tool

Current Baseline: All campuses should be configured to support access to the tools while classes are in session excluding planned maintenance windows. System backups are not considered planned maintenance and the system must be available during all backup processes.

Stretch Baseline: All campuses should support teaching and learning with these tools while classes are in session via phone, e-mail, and chat support. Responses to the users must be done within a timely manner.

A.10 Technology - Computer Labs

Current Baseline: All campuses must evaluate and deploy a set of deployment tools to provide consistent provisioning of computer images.

Stretch Baseline: All campuses must evaluate and deploy a set of deployment tools to provide consistent provisioning of digital media, including but not limited to high resolution images, audio, video, and multimedia animations.

Current Baseline: In general, any software that is used directly in a course should be available in a general-purpose or discipline-specific computer lab on campus. Campuses should help students with their learning outside of the classroom.

Current Baseline: Labs should be configured to support individual student activities in a supervised environment. Open lab areas contain copies of all academic software used in classroom instruction. Technicians should be available to assist users with class assignments or research.

Stretch Baseline: Additional software and tool that can be included in the lab:

- Blogs
- Wikis
- Podcasting
- Instant messaging technology
- Controllers
- Key Servers

Stretch Baseline: All computer labs will be configured such that:

- Academic technology defines the most commonly used academic software and manages it in computer labs.
- Software licenses are pushed out to labs and patches are automated.
- All hardware is budgeted and refreshed on a 3-year cycle.
- Access to labs outside of the classroom.
- Access to technology and the learning environment where student do their work.

A.11 Technology - Access to Library Information System (LIS)

Current Baseline: Single Sign-on – LMS to Library Resources. Minimally, integrated authentication between the LMS and core library services like those below will allow the information embedded in the LMS from library systems to be directly accessed without re-authentication.

- Electronic Reserves
- Electronic databases
- Library catalog
- Reciprocal borrowing

Current Baseline: Create Partnerships with the Library and Librarians

- Assist librarians in developing generic library modules to embed in courses to aid faculty in embedding library information into courses

- Working with faculty in specific courses, add a subject matter librarian who can support research projects, help locate electronic resources, and provide direct support to students in individual courses

Current Baseline: All campuses should provide training and support of the LMS.

Current Baseline: Provide documentation and FAQs for the users of the LIS.

A.12 Technology - Content Repository

Current Baseline: The content repository is a general storage area that will assist with the sharing of information. The site should be accessible by faculty and staff.

Current Baseline: Anytime/Anywhere Access - All campuses should be able to be configured for 24 x 7 access to learning content and administration by students and faculty excluding planned maintenance windows. System backups are not considered planned maintenance and the system must be available during all backup processes.

Current Baseline: Unique Access - The CSU has an Identity Access Management (IAM) program in place that establishes authentication, identity management, and unique access. Each campus should be following the program when setting up access to the Content Repository.

Current Baseline: Integration with CMS - All campuses should support integration between the Content Repository, LMS, and the portal.

Current Baseline: All campuses should provide training and support of the content repository. This support would include support for the tool as well as assistance with content creation such as video streaming/multimedia capturing.

Current Baseline: All campuses should provide a content repository to allow sharing and reusing of files across sections, courses, and department.

A.13 Technology - ePortfolio

Current Baseline: Anytime/Anywhere Access - All campuses should be able to be configured for 24 x 7 access to learning content and administration by students and faculty excluding planned maintenance windows. System backups are not considered planned maintenance and the system must be available during all backup processes.

Current Baseline: Unique Access - The CSU has an Identity Access Management (IAM) program in place that establishes authentication, identity management, and unique access. Each campus should be following the program when setting up access to the ePortfolio

Current Baseline: Integration with CMS - All campuses should support integration between the ePortfolio, LMS, and the portal.

Current Baseline: All campuses should provide training and support of the content ePortfolio.

Current Baseline: Students will have a centralized area to store objects, articles, activities, and achievements and share them with faculty, and staff.

A.14 Assessment

Current Baseline: Each campus should identify a standard set of data and method of gathering it to adequately compare it. Some attributes to be assessed are:

- Number of courses using the LMS
- Number of faculty using the LMS
- Number of students using the LMS

- What LMS tools are used the most? The least?
- Which departments/colleges are using the LMS? What tools are these departments and colleges using?
- What tools are in use
- How many are using each tool
- What is the frequency of use
- What is the value of the tool
- Does it enhance or impede learning
- What is the perceived value of implementation and satisfaction
- What is the value that faculty and students attach to it?
- Importance of the tool
- Entry and exit assessments
- Tools that help track and support the learning outcomes.

Current Baseline: All campuses should perform a separate assessment of all campus help desk and technical support activities. Find where coordination or centralization might A) improve service to users and B) create efficiencies to relieve the workload of our IT staff. This includes a conscious definition of what services should be provided, which common tools and methods are needed, and which organizations should provide these services.

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