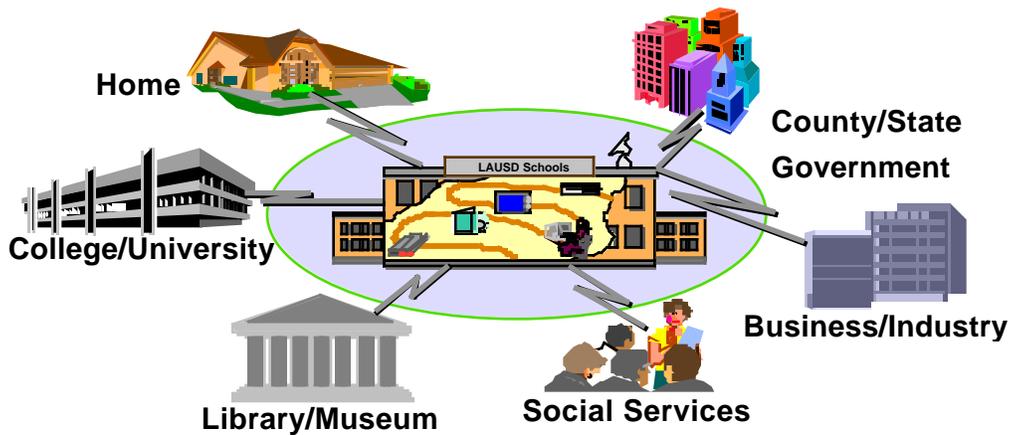# LOS ANGELES UNIFIED SCHOOL DISTRICT

INSTRUCTIONAL TECHNOLOGY PLAN

Prepared in consultation with:

The Center for Educational Leadership and Technology
Marlborough, Massachusetts
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TABLE OF CONTENTS

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- Corby Alsbrook, Principal, El Sereno Elementary
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- Stephen Lawler, Principal, Portola Middle School
- Michael Perez, Principal, Gardena High School
- Dana Perryman, Principal, Muir Middle School
- Philip Saldivar, Principal, San Fernando High School
- Jacklyn Thompson, Principal, Virginia Road Elementary
- Annie Webb, Principal, Locke High School
- William Chew, Principal, Stephen M. White Middle School

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Plan Development and Coordination

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EXECUTIVE SUMMARY

The Los Angeles Unified School District has taken a large step toward the implementation of an instructional technology program that will support the educational goals of the District. While many things need to be accomplished, the Instructional Technology Plan provides direction for the District support of a technology enriched school environment with that technology integrated into the curriculum.

The development of an adequate instructional technology program depends upon the infrastructure support provided to schools and classrooms. To that end, the District has developed a comprehensive, standard local area network plan for schools. Through a marriage of the E-rate program (i.e., a federal program that provides discounts for technology infrastructure leading to Internet connectivity, etc.) and the District Proposition BB effort, LAUSD will be able to:

- Provide each of the K-12 schools with an appropriate local area network
- Provide the District infrastructure that will support those school networks

Access to the Internet is one example of the applications that will be available to teachers in the future as this infrastructure is provided. Other applications will be:

- Two-way video teleconferencing – AP classes taught from one location while students "attend" the class from another school.
- Extended learning – the "home bound" student would be able to log into the classroom in "real time" – as the class is being taught.
- Professional Development on demand. The teacher will be able to log onto the system and take specific course at times convenient to the teacher.
- Courses can be developed and stored on LAUSDnet servers. The teacher will take an "on line" course by signing on to the District's web site.
- The system will have the capability to "stream" video. A video presentation of a course would be available for downloading onto the school server and, then, would be available to the teacher "on demand."

It is critical to acknowledge that the infrastructure and the use of the resulting technology in classrooms will have a direct impact on the instructional program in schools. New and different modalities for professional development will enable the District to provide opportunities for teachers to enhance their skills without removing them from their classrooms. Teachers will take what they have learned back to a technology enriched classroom; integrate the technology into their curriculum, directly and indirectly affect student achievement.

The Instructional Technology Plan was developed with the active participation of many in the school community. The Instructional Technology Application Facilitators (ITAFs) and other educators participated in focus groups led by representatives from the Center for Educational Leadership and Technology (CELT). Additionally, interviews were held with key stakeholders and school administrators.

The Los Angeles Unified School District Instructional Technology Plan, builds upon the successes of the past. For example, the award winning LAUSDnet web site (www.lausd.k12.ca.us) receives 1,800,000 visits each month. Many of the schools in LAUSD are digitally connected (i.e., the school has a dedicated "wire") to the Internet, and LAUSDnet supports more than 80,000 Internet email accounts. Additionally, 5,000 teachers per year (approx.) receive instructional technology staff development in the District technology centers.

The success of LAUSDnet and the instructional technology professional development that has taken place in LAUSD have made teachers and administrators aware of some of the exciting benefits technology can bring to the classroom. As the E-rate/Proposition BB infrastructure moves across the District it will become imperative that the District have a comprehensive plan that will enable staff to use the applications that will become available to them.

A District Instructional Technology Plan is required to participate in the federal E-rate program. In addition, the District Information Technology Plan recommended that a comprehensive plan be developed to describe the instructional technology needs of the LAUSD. This plan presents a blueprint for Instructional Technology in LAUSD for the next three years. As such, it should be considered a "living" document, to be changed as the needs of the district change.

 The following topics represent the major areas of focus of the Los Angeles Unified School District Instructional Technology Plan. In many cases, existing plans and programs are reinforced; in other areas, new direction and innovation are required:

Curriculum and Learning Standards

As the District enters a new century of public education, it is imperative that educators create an instructional environment that meets the ever-changing and diverse needs of the students served. It is through the incorporation of technology systems, and the tools that technology provides that will enable teachers and administrators to address individual needs and enhance student and staff performances.

The educational leadership of LAUSD has noted that, as the availability of technology use increases, the options to increase literacy throughout the district will be greatly enhanced. Only pockets of innovation currently exist in the district. More must be done to model the uses of technology through all levels of education to enable teachers to take advantage of the new infrastructure.

Technology can assist learners at various stages. To take advantage of developmentally appropriate, technology-enriched lessons, a systematic approach for integrating technology into the curriculum is recommended. The district must first embrace a set of technology competencies. Core technology competencies serve as standards and benchmarks in identifying the specific technology skills that LAUSD students and teachers must possess. In mid-November 1999, the International Society for Technology in Education (ISTE) published and widely disseminated the National Education Technology Standards (NETS), *Connecting Curriculum and Technology*. In that month, the LAUSD Instructional Technology Applications Facilitators (ITAFs) recommended that the NETS standards be included as a component of this plan.

With the NETS standards adopted district-wide, the District will be in a position to develop strategies for integrating these standards into the district's curriculum. The plan notes that there is a need to align the district student and teacher technology competencies with the California State Standards.

Teaching and learning strategies, when coupled with technology, can prepare 21st century learners to make the transition from school to work successfully. Infusion of technology into the curriculum provides students with successful elements of learning, which are active, cooperative, interdisciplinary and individualized.

Technology Enhanced Learning Environments

To produce an appropriate and realistic environment for learning, the district must address the equitable distribution of resources and facilities. Curriculum decisions should drive the selection and acquisition of technology. The Instructional Technology Plan looks at strategies to create an enhanced learning environment and ways to distribute equitable resources throughout the district.

The plan notes that the student access to technology and teachers trained to integrate it into the curriculum are unevenly distributed. Grants and other funding resources are not available at every school. Principals have played a pivotal role in the acquisition of needed resources, but there must be a more comprehensive plan to provide technology in classrooms.

The coordination of Proposition BB and the federal E-rate efforts will insure a standardized local area network in each of the District schools. Parallel with this effort, LAUSD must define and embrace the "critical mass" ratio of one computer for every six students (6:1) for classrooms and learning environments at all levels. (Critical mass is defined as that level of technology infusion sufficient for measurable gains in student performance.) The critical mass may not be adequate in every school or classroom, but it is a baseline from which we can meet specific needs.

A master procurement and allocation plan must be initiated. The efficient acquisition of the needed technology resources will provide all students access to current and appropriate information. It will insure that the district gets maximum use of its technology investments. Coordination of vendor demonstrations and the negotiation of high volume purchases will assist schools in acquiring computers and software.

Professional development delivered online, and using other technologies, will help staff obtain specific technology competencies, thus insuring the effective use of the newly acquired equipment.

After establishing and communicating minimal standards of equipment, the District should research approaches for the purchase of computers for staff, such as:

- Payroll deduction for the purchase of computers
- Shared cost between teachers, administrators and LAUSD
- Software licenses expanded to enable loading onto staff computers
- Teacher computer loan programs at school-sites
- Lease/purchase equipment options for teachers
- Free computers to teachers who acquire all staff technology competencies

Libraries and Information Resource Centers need to be identified and supported as critically important components of the district goals. The libraries and resource/media centers of the 21st century must be equipped with the ability to deliver information from the media center to every desktop. A comprehensive media management system and a uniform library automation system, delivered over the wide area network (WAN) will increase student access.

LAUSDnet equipment will be upgraded so that the WAN will be able to support a "voice/data/ two-way video network" with fast access to the Internet. Security and filter issues will be addressed. While "security" is expensive, the resulting losses from an unsecured network would be detrimental in many ways.

Human Resource Management and Development

Essential components of this section of the Instructional Technology Plan address the issues of professional development, organization and support. Effective use of technology, in an appropriate environment, requires a trained staff. Reactive and stand-alone training have been ineffective methods for delivering professional development. Training efforts must be coordinated and focused on the needs of the trainees, not on the ideals of the trainers.

Support services to maintain the networks and the hardware systems must be decentralized or outsourced to meet the growing demands of more users. It is recognized that the networks and computers are machines and wires connected to other machines. Teachers will depend on these machines to work "on demand." They must be available whenever a teacher or student has to use the system. To that end, appropriate support is not optional—it must be provided.

While professional staff development has been fragmented in the past, a coordinated effort is proposed between the Staff Development Branch, Instructional Technology Branch and the Information Technology Division. LAUSD needs to determine the scope of professional development services that will be provided at the district, Local District and school levels. Continuity will be promoted by adopting a planning model and process that promotes the alignment of professional development with district priorities and mandates, and Local District and school improvement goals. In addition, an effective professional development planning model and process will take into account how technology can be used as a tool to:

- Assess competency-based staff development needs and priorities

- Do market research and marketing of professional development opportunities

- Communicate opportunities for professional development

- Engage in ongoing collaboration, communication, support, and technical assistance

- Evaluate the effectiveness of professional development activities (i.e., the impact on teaching practices)

- Schedule, track, analyze, and manage professional development activities and data

- Provide confidentiality and security of human resource data

District-wide expectations for Local Districts and school-based training must be communicated effectively. Technology supported delivery systems must accommodate the needs of a large number of users. With the large numbers of teachers who need professional development, the old model of the instructor standing in front of an auditorium full of teachers   ("sage-on-the-stage") must be changed. Using delivery systems supported by the new District infrastructure, teachers will have more, and different, opportunities for success.

District personnel must model expectations of technology integration throughout all facets of daily operations and communications. A shared technology vision is critical in promoting successful technology integration in schools and promoting student academic achievement.

A competency-based professional development model will include exemplars of what those competencies should look like when applied to daily practices. Professional development should be self-directed and promote lifelong learning. A model for developing competency based professional development will use publications such as *Connecting Curriculum and Technology* (ISTE) and the Milken Professional Development Compendium. Delivery options will include online training, two-way video conferencing, cable broadcasting (including KLCS), online discussion groups and other modes of learning.

Comprehensive staff development will involve long-term planning and will include a process to monitor individual progress along a continuum. This will result in a more focused professional development program that can be differentiated to meet the needs of the individual teacher or administrator.

Plan Implementation Issues

At the conclusion of any plan, implementation procedures should be established. The creation of technology standards and policies will insure that the integration of technology in the district will have the desired effect. Communication of these policies and standards must be complete and consistent.

Schools have had to rely on grants, bonds or specially funded mandates to acquire desired technology and have historically negotiated individual contracts for hardware and software. The District should develop a regularly budgeted technology acquisition plan.

An effective centralized maintenance system for the computers in schools, with service level goals and standards for service should be developed. The current maintenance staffing is critically under-manned and limited. Definitions of obsolescence for instructional machines must be defined continuously. Uses for older equipment should be developed and a plan for the disposal of unusable equipment should be environmentally safe.

The Grants Assistance Office has only been able to disseminate information and coordinate required activities. Many grants are available that can be used to enhance the technology environment at schools and provide additional funding for professional development. The District Grants Assistance Office should be augmented to provide grant writing assistance to those who prepare the grants.

For the most part, instructional technology resources are not available for community members beyond the school day. There is a need to improve family outreach. Increasing student access to computers, before, during and after school is important. By making technology available to students "after hours," the equitable distribution of technology in the homes of students begins to be addressed.

Other implementation issues should be considered:

- Procedural guidelines for the installation of new equipment
- A policy for the acceptance of donated equipment
- Budget-lines to insure a systems approach to reach critical mass of a student-to-computer ratio across the district
- Policies regarding ethical and appropriate use of technologies. These policies need to be reviewed and updated, in a timely fashion
- District-wide compliance to the ethical and appropriate use policy

Monitoring and Evaluation

A major benefit of planning is that it serves as a learning catalyst. As plans, such as the Instructional Technology Plan, are put into place, the District must monitor, evaluate and revise the plan for maximal effectiveness. Strategies for inclusion of this reflective process consist of ongoing data collection regarding selected performance measures, timely communication of data and analyses to key decision makers, and periodic reports that address both implementation and impact assessment.

While the Instructional Technology Branch will need to continue to oversee implementation planning, it should integrate strategic technology planning into LAUSD's ongoing effort addressing District *Curriculum Guides* and the *California State Learning Standards*. All technology planning should be focused on what is required to advance student achievement in meeting performance goals based on established learning standards.

PREFACE

The *Instructional Technology Plan* is the culminating document of the three-phase planning study facilitated by CELT Corporation in cooperation with Los Angeles Unified School District staff. The first phase of the study involved investigation, data gathering, and analysis of current information regarding the deployment of technology in schools for instruction, status of curriculum and assessment initiatives, technology support services district wide, equipment and infrastructure inventories, staffing and staff development practices, technology standards, policies, and procedures. Phase two of the study focused on a comprehensive review of findings and the drafting of recommendations for action. Phase three was concerned with the development of system design features and key initiatives for addressing the needs of the school district for improved teaching and learning. The resulting plan for action provides direction for a five-year period for LAUSD.

This document is comprised of the following six sections:

Section 1: Acknowledgments – Lists the many individuals and multiple stakeholders involved in the technology planning process.

Section 2: Preface – Provides an overview of the LAUSD *Instructional Technology Planning* process, results, and recommendations.

Section 3: Technology Planning Foundations – Presents the district's Technology Mission statement, Vision, and Strategic Goals; details the current implementation status of technology initiatives; outlines study methodologies used; and, expresses commitment that *Instructional Technology Planning* will support the attainment of the learning standards and priorities in LAUSD.

Section 4: Instructional Technology Blueprint – Includes rationale, major findings and recommendations, and implementation approaches for the blueprint components listed below.

- Curriculum and Learning Standards
- Technology Enhanced Learning Environments
- Human Resource Management and Development
- Plan Implementation Issues

Section 5: Implementation Resources – Consists of monitoring and evaluation approaches, estimated budget, and a four-phase action plan.

Section 6: Appendices – Contains the following resources:

A. Student Technology Competencies
B. Teacher Technology Competencies
C. Instructional Unit Plan Model
D. School-Based Assessment Rubric

This plan is considered a complementary document to the *Information Technology Plan*, developed by the district in 1999.

Instructional Technology Plan
for the
Los Angeles Unified School District

Planning Foundations

1.0   INTRODUCTION: THE INFORMATION AGE AND THE CHANGING EDUCATIONAL ENVIRONMENT

Society is completing an evolutionary shift from the Industrial Age to the Information Age. Accordingly, educational institutions must realign their practices with Information Age standards. Those that lag behind in technology capacity, infrastructure, technology education, and establishment of support structures risk being unable to fulfill their mission of preparing students for the future.

Technology has been a driver of change in such diverse areas as global communications, economics, the arts, politics, and environmental issues. While the world of business has readily adapted to and thrived upon technology innovation, the world of education has been relatively slow to reform.

Vision is needed to create new communication strategies, new paradigms for financing, and new models for educating. LAUSD has already begun much of this process including intense work on standards, infrastructure development, alliances with businesses and universities, and the recognition of the need for long range technology planning.

Our changing society and workplace require citizens who can take responsibility for their own learning and well being on a life-long basis. Educational reforms, which help develop our citizens, are dependent on the adequate and appropriate infusion of technology for their support. The time to think and plan strategically to further enhance instructional technology in LAUSD is here.

The rate of knowledge generation and the corresponding demand for its use increase exponentially. The life cycle of information continues to shrink. Much of what was learned a few years ago is no longer relevant.

It is projected that workers will typically change professions as many as five times during their working careers. Some estimates indicate that workers in the 21st century will require one year of formal instruction for every seven years of employment. Businesses have increased their technology education programs in response to employee needs for continuous professional growth. It is critical that LAUSD follow this example.

It has become increasingly more important to measure a person's potential by what he/she knows rather than how many years of school are completed. This is a primary motivation to move toward standards-based education. New paradigms indicate a shift in educational requirements focusing on subject matter rather than seat time.

Restructuring for the use of technology within an educational environment will require simultaneous changes throughout the entire organization. Teaching methods have to be modified curricula updated, and organizational structures changed to expand communication options. New technology is of little value if teachers do not use it or do not have access to staff development aimed at building their proficiencies in this area. Classroom support for their efforts at integration is also critical.

The Information Age is representative of a time where the volume of information is increasing exponentially while its life expectancy declines. Eight years ago, there were less than 50 viable sites on the World Wide Web. Today there are over 50 million. To operate successfully in the environment, the schools must change their philosophy on how they collect, manage, distribute, and control information.

It is important for the future that schools produce critical thinkers capable of learning and navigating through vast amounts of available information. There are many teachers who use technology but *do so merely as an extension of the existing learning model.* The teacher must reconsider his/her role as the source of information and the student, the passive learner. Students must develop the skills necessary to become lifelong learners for individual success as well as for the economic stability and development of the community. This requires the interweaving of content objectives, process skills, and technology competencies at all levels of instruction as well as an extensive reformation in how we perceive teaching and learning. First and foremost, students must be able to access information, manipulate data, synthesize concepts, and creatively express ideas to others using video, text, and audio media. Technology can virtually bring the work to the child and provide teachers with a depth and richness of instructional approaches never before possible.

With the establishment of academic standards, technology can bring greater efficiency to both the instructional and administrative realms. This is especially important as teachers begin to use performance-based assessment to validate student learning and to maintain detailed records and learning profiles for all students.

In the future, the role of the teacher will expand into new frontiers. They will be mentors, architects, navigators, evaluators, synthesizers, and assume any other role that will assure student success. They will be the designers and visionaries who will make technology implementation in the classroom successful.

Administrative personnel must lead the way toward change. They must make clear strategic decisions and provide adequate support and technology education *while creating technology-enriched learning environments in which people can do meaningful, quality work.* They must, however, have access to support systems that can provide them with timely access to information that guide adaptations in the learning system for improved, better targeted instruction.

2.0   STUDY DESIGN

The fundamental purpose of this planning project was to provide the Los Angeles Unified School District with key findings and recommendations for upgrading its current instructional computing capacities and administrative computer network. A comprehensive information technology infrastructure is proposed that will support instructional, administrative, and communication functions and will address the mission, vision, and educational outcomes developed by the school community.

2.1   Purpose of the Planning Process

Major objectives of the study were to:

- Conduct awareness activities regarding the planning study for staff and community members
- Conduct a review of the existing technology resources and needs including:
  - assessment of current and projected technology applications
  - review of current and projected curriculum improvement activities
  - perceptions of key staff regarding existing and future technology needs
  - assessment of the technology support system resources
- Identify strategies that support teaching and learning as well as opportunities for professional growth using technologies

- Design strategies for improving the efficiency of instructional management, communications, and administrative functions through technology applications

- Plan for the development of a district-wide information network system with integrated administrative, student, and curriculum information that builds effectively on the schools' current technology resources

2.2 Organizational Structure for the Planning Project

The Center for Educational Leadership and Technology (CELT), in collaboration with Los Angeles Unified School District (LAUSD) personnel, developed the following organizational design to conduct this strategic planning study.

- **Study Leadership**

Both LAUSD and CELT required specific organizational coordination for this project (see Figure 1). Andy Rogers (LAUSD) and Robert Milley (CELT) served in the roles of project co-directors, ensuring that overall goals are met. The Los Angeles project manager for the study was Joe Oliver.

Board of Education
Superintendent of Schools   Dr. Ruben Zacarias/Ramon Cortines
Deputy Superintendent   Dr. Lilliam Castillo
Associate Superintendent, Instruction   Carmen N. Schroeder

Instructional Technology   Jim Konantz

LAUSD Project Managers Andy Rogers/Joe Oliver	*CELT Project Manager* Robert Milley

Planning Oversight Team

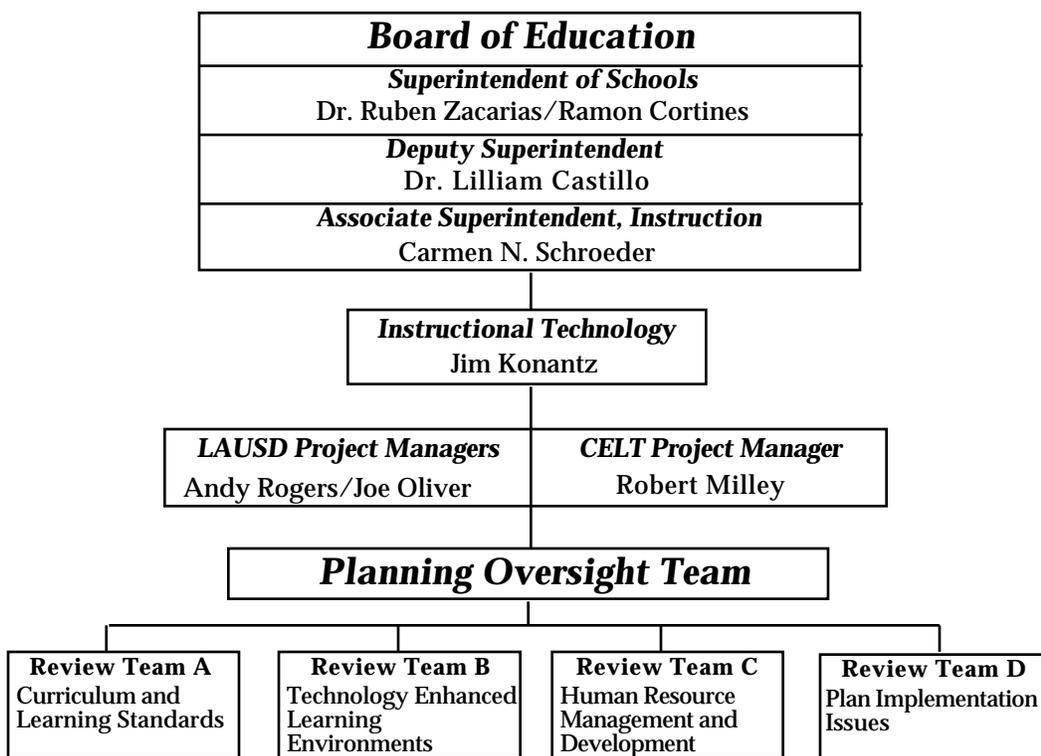| **Review Team A** Curriculum and Learning Standards	**Review Team B** Technology Enhanced Learning Environments	**Review Team C** Human Resource Management and Development	**Review Team D** Plan Implementation Issues

Figure 1: Project Organization

Project director and managers conferred regularly, participated in the scheduled meeting and conferences, and communicated through regular progress reports on project activities to ensure smooth coordination of the many tasks established in the project work plan.

- **Planning Oversight Team**

  The Planning Oversight Team played a key role in initiating the project through a meeting with the Los Angeles project mangers and through regular communications with CELT and LAUSD leadership during the project.

- **Study Sub-project Teams**

  The study was divided into four sub-projects. Each subproject team contributed to the review and development of the findings, recommendations, and implementation approaches for their content area, including:

  Subproject Team A: Curriculum and Learning Standards

  Subproject Team B: Technology Enhanced Learning Environments

  Subproject Team C: Human Resource Management and Development

  Subproject Team D: Plan Implementation Issues

  Each sub-project team consisted of six to ten members, representing the diversity of the District, who performed the following roles:

  - Provided leadership in the development of LAUSD's long-range plan for technology

  - Assessed study design and methodology

  - Analyzed needs assessment strategies

  - Investigated ensuring equality of access to technology

  - Performed review and critique of findings, recommendations, and implementation strategies

- **Planning Study Approach and Methodology**

  CELT subscribes to a methodological approach that combines both qualitative and quantitative elements. By synthesizing the two, CELT conducted an assessment of the instructional technology needs in LAUSD that was comprehensive in both breadth and depth. The breadth was attained through quantitative measures designed to gain a generalized understanding of the existing levels of instructional technology. Depth was achieved through a variety of qualitative methods that included conducting focus groups sessions, interviewing key stakeholders, and reviewing LAUSD documents. These components served to provide a detailed view of the instructional technology needs of the district. The combination of these methodologies enabled a broad overview of needs while providing an understanding of the diversity of perspectives within LAUSD.

- **Quantitative Methods**

  The quantitative portion of the LAUSD needs assessment consisted primarily of document and inventory review, assessment information, and analysis of a previous planning document. Other areas, such as the staff development programs of teachers and instructional staff and facilities reports were also addressed. These documents provided recent background on the availability and use of technology. Upon collection, an analysis of quantitative data resulted in the generation of an extensive set of descriptive data. This output was reviewed and is incorporated into the major findings.

- **Qualitative Methods**

    Qualitative data was gathered using a variety of approaches listed below:

    - Focus Groups — Several focus groups allowed members of the Los Angeles school community to offer their views on numerous issues and topics. In each of the sessions, eight to fifteen educators gathered to provide perspectives on the current status of instructional technology and on future objectives based upon their own unique experiences. Included in focus groups were principals, technology support staff, special education staff, teachers from various grade levels, support staff, professional development staff, administrators, and members of the Instructional Technology Branch.

    - Key Stakeholder Interviews—In-depth interviews were conducted with several other leaders in the education community responsible for areas such as professional development, curriculum, library services, district leadership, and technology support services. Interviewees responded to questions as they related to their specific roles within the district. These interviews allowed further identification and understanding of each individual's decision making regarding the implementation and support for instructional technology.

    This extensive collection of qualitative data offered valuable information from a wide sampling of both individuals and groups of individuals who have a stake in LAUSD's technology decision making. Although the quantitative data obtained from audit reports and other sources uncovers patterns that will initiate the formulation of recommendations, the extensive qualitative data provides a critical perspective for CELT staff, ensuring that forthcoming recommended major initiatives and implementation approaches are both applicable and useful to all.

3.0   INSTRUCTIONAL TECHNOLOGY MISSION AND VISION

A critical step in the planning process is the development of district-wide mission and vision statements to provide both a focus and a foundation for plan development. Technology should be clearly supportive of fundamental mission of the district. The study management team agreed that the district's current mission, established earlier through a broad-based strategic planning process, provides excellent direction for the *Instructional Technology Planning* study.

The purpose of a technology vision statement is to provide readers with a view of how technologies will positively impact future teaching and learning environments. The vision statement is descriptive and provides a response to the question "What will it look like when we get there?" The draft vision, offered by the Instructional Technology Application Facilitators (ITAFs), may be modified as various constituencies and stakeholders respond to it and as the planning process itself illuminates for the district many of the potential outcomes of a successful technology planning venture.

ITAFs met regularly and did develop a district ITAF Mission that may serve as a foundation to the technology planning effort. The resulting Mission Statement is:

… to facilitate the planning, implementation, and support of instructional technology to enhance student learning.

A Technology Vision Statement that expresses a view of the future is offered as follows:

Empowered with technology, a new generation of critical thinkers will emerge as successful global citizens.

The *Information Technology Plan* communicated some visionary components developed by LAUSD leaders, teachers, principals, students, and administration regarding the impact of technology. Some elements are offered below:

- Student achievement is at record levels.
- Teachers receive relevant training.
- Curriculum is customized and dynamic to meet students' changing needs.
- Parents are actively involved in their children's education.
- Local and global businesses are strong supporters and investors in LAUSD.
- High operational efficiency is facilitated by the ability to access and share information readily.
- Teachers maintain relevance in rapidly changing subject matter.

Technology can assist in making many of the expressed visionary components become reality.

4.0   STRATEGIC PLANNING GOALS

Strategic goals for the *Instructional Technology Plan* and its implementation reflect high level LAUSD educational priorities for which technology must provide support. Also incorporated are success factors that are critical to enabling instructional technology infusion to have an impact on learning within schools and to provide equity of access throughout the district. Strategic planning goals for the *Instructional Technology Planning* project are offered below:

- Identify and implement approaches for using technology to support the district's goals and learning priorities.
- Identify student technology competencies/standards and deliver these equitably to all students.
- Plan and provide for effective human resource support for curriculum/technology integration within schools and Local Districts.
- Design and implement competency-based professional development models and delivery systems to help teachers improve instruction through the use of technology.
- Design models for technology enhanced learning environments and promote their establishment throughout the district.
- Institute efficient and effective strategic planning processes at the school and Local District levels that incorporate planning for technology.

Instructional Technology Plan
for the
Los Angeles Unified School District

Blueprint

1.0   INTRODUCTION

In recent years the term "technology" has been synonymous with "computers". Today technology implies broad connotations including Intranet/Internet, e-mail, voice mail, satellite downlinks, video, multimedia, and a wide variety of peripheral and portable devices. Advancing technology is creating an atmosphere requiring fresh visions to shift from Industrial Age instruction to Information Age instruction. As the move toward standards-based education progresses, instructional environments will be increasingly learner driven. To achieve a philosophical and instructional metamorphosis, technology must be an ongoing top priority, not as an end unto itself, but rather the means to enhanced teaching and learning. This technology plan should be considered a blueprint for change. With rapidly changing technologies, the district must adapt continuously and adopt the understanding that the only constant is, indeed, *change* itself. The planning process must be cohesive, dynamic and ongoing.

The LAUSD *Instructional Technology Blueprint* includes rationale, major findings, major initiatives, and implementation approaches for the blueprint components listed below:

- Curriculum and Learning Standards
- Technology Enhanced Learning Environments
- Human Resource Management and Development
- Plan Implementation Issues

The accompanying Action Plan, found in the Implementation Resources section, further refines the action steps, levels of responsibility, and timelines for implementation for key initiatives provided in the Blueprint.

2.0   CURRICULUM AND LEARNING STANDARDS

> *In times of change, learners inherit the earth, while the learned find themselves beautifully equipped to deal with a world that no longer exists.*
>
> — Eric Hoffer

Curriculum and learning standards address issues that comprise the core mission of the district, what we teach how we teach, how we assess learning, and how we manage the instructional environment. The topics addressed within this section are:

- Curriculum and Technology Integration
- Student Technology Standards
- Assessment
- Curriculum Development/Learning Management
- Funding Approaches

2.1   Rationale

LAUSD must augment and transform teaching and learning with technology to promote new teacher and student behaviors. New technology systems and tools can help teachers adapt even their current instructional materials and strategies to address the diverse needs of individuals and groups of students in meeting learning standards. To enhance teacher performance, increase district-wide accountability, and make *every* child successful, the effective and timely management of large amounts of curricular and assessment information becomes pivotal. Technology that can help educators make effective choices can be found in web-based, relational database decision-support systems that link curriculum standards, student data, instructional resources, and assessment strategies. To truly improve learning, educators must identify the appropriate content standards, process skills, and technology competencies that their students need to acquire. Strategies regarding integration of these skill areas need to be developed and successful practices shared throughout the district.

2.2   Major Findings

LAUSD leadership and educators look forward to the availability of instructional computing devices to increase the options and approaches available for meeting the educational learning needs of their diverse student populations. A major district educational priority is to improve literacy skills, with a focus on grade three as a benchmark level. While pockets of innovative technological use exist within LAUSD, there are few channels for teachers to share successful curriculum and technology integration practices with colleagues across the district. Strong instructional improvement models have resulted from initiatives such as the Los Angeles System Initiative (LASI) and have addressed embedding technology within some subject areas. Eisenhower Grant funds have helped support professional development in math, science, and technology. LAUSD operates its own Internet service and, through its web site *LAUSDnet*, has laid a strong foundation for the expansion of instructional technology in Los Angeles schools.   Still, more needs to be accomplished to increase the dissemination of effective practices in using instructional technology.

Of critical importance is the need for a comprehensive online system that aligns learning standards with student information, educational resources, and assessment data. District-wide student technology competencies are being adopted. The district is poised to embrace the National Educational Technology Standards (NETS) for students with some modifications. In addition to the content area alignments in the ISTE guide *Connecting Curriculum and Technology* (English, language arts, foreign language, mathematics, science, and social studies), LAUSD will need to align the NETS with the California State standards. These alignments will augment the strong consideration within LAUSD to establish technology competencies as a graduation requirement.

2.3   Major Initiatives

Curriculum/Technology Integration

- Identify and adopt strategies for systematically integrating technology into all aspects of the curriculum.

- Include, as part of LAUSDnet and ultimately as a component of the district's decision support system, an easily accessible, relational database of lesson plans and/or units for sharing successful integration practices across the district.

- Research and disseminate, via the LAUSD web site, successful strategies, programs, and models for addressing the needs of at-risk students from pre-K through grade 12.

- Research and document successful uses of alternative desktop computing devices supporting curricular goals, improving literacy, increasing student performance on district standardized tests, and addressing the district's priority areas.

- Develop and implement a district-wide online system that aligns educational materials with state learning standards and with LAUSD's goals and major educational priorities.

Student Technology Standards

- Select and endorse a comprehensive set of student technology standards, K-12, with associated student assessment strategies and/or performance measures.

Assessment

- As a component of the district's decision support system, integrate an automated, easy-to-use assessment system, composed of multiple indicators and linked to the district content standards, that provides teachers and administrators with information about student mastery of learning standards and cross-discipline competencies.

- Measure the impact of pilot projects and school-level initiatives in the area of assessment.

Curriculum Development/Learning Management

Expand the criteria and components of the current decision support system design to include a web-based curriculum development and learning management system using relational database architecture to link curricular, instructional resource, assessment, and student information.

Funding Approaches

- Recognize that the impact of technology and the investment in the infrastructure to support that technology requires on-going, annual, and consistent support.

- Establish a "line-item" in the budget for instructional technology.

- Focus on channeling federal, state, and local grants and entitlements into technology resources and initiatives that address the district's priority areas.

2.4   Implementation Approaches

Curriculum/Technology Integration

Two major educational movements have converged that are having a strong impact on approaches to teaching and decisions regarding resources. State and local officials have prescribed learning standards for major subject areas and have aligned high-stakes testing to these standards. The second movement is the increasing use of technology to support academic goals while providing students with the technology skills required for an information-based world of work.

Accountability for attaining student standards has the full attention of teachers and school leadership. Decisions regarding technology use has been strongly influenced accordingly. If technology solutions do not address learning goals and priorities, teachers will be reluctant to embrace its use. It is important for districts that want improved learning and that understand the role of technology to make decisions that clearly link hardware, software, and infrastructure use to meet established goals. Teachers commonly report that identifying software that meets their curriculum needs is difficult. Locating Internet resources that are appropriate in addressing standards can also be tedious and time consuming without appropriate search strategies.

Accordingly, LAUSD must strive to identify, embrace, and disseminate a set of research-based curriculum/technology integration approaches. These approaches should align student technology standards with content standards, and process skills, such as those identified by the International Society for Technology in Education (ISTE) 1999 publication *National Educational Technology Standards for Students ~ Connecting Curriculum and Technology*. This publication is available from the United States Department of Education Publications Service at (877) 4-ED-PUBS (433-7827).

Efforts must be made to focus major curriculum and technology integration initiatives on specifically identified district priorities or Local District priority areas such as:

- English language development
- Literacy skill improvement
- Special education
- Students at-risk
- Information literacy

A process should be established for creating and regularly updating information and guidelines to assist teachers in the selection of technology-based resources that are differentiated by instructional levels and content area. *Children's Software Review* magazine uses six criteria for assessing the quality of educational software resources. These are ease of use, childproof design, educational value, entertainment value, pedagogical design, and value versus cost. A major factor in any evaluative process must be linkage to standards and school/ district priorities. The California Instructional Technology Clearinghouse has teams of teachers reviewing instructional software for overall quality as well as linkage to the state curriculum standards. A free database of reviews may be accessed at http://clearinghouse.k12.ca.us. A number of other quality review resources are available including ISTE's *The Educational Software Preview Guide*, an annual publication available at http://www.iste.org. The Association for Supervision and Curriculum Development (ASCD) also produces a resource, *"Only the Best,"* located at http://www.ascd.org.

The district should establish a web site to distribute technology selection guidelines to teachers. District staff will require guidance and instructions for using the web site effectively. Resource selection guidelines and processes must also be made part of staff development design and implementation.

The district should consider developing a district-wide online system that aligns an array of educational materials, technological or otherwise, with state learning standards, and with LAUSD's goals and major educational priorities.

Current teaching and learning strategies coupled with technology can prepare 21st century learners for the challenges they will face in a highly technical society. Research leads us to believe that four key elements have the most impact on providing students with successful classroom education (Apple Classroom of Tomorrow):

- Active learning

  - Technology-based tools allow students to demonstrate problem-solving and higher-order thinking skills interactively.

  - Sensors and probes allow students to collect data such as temperature, pH, pressure, voltage, light, and heart rate which can easily be analyzed, manipulated, and transferred to lab reports.

- Cooperative learning

  - Telecommunications provide students with the ability to work together even when separated geographically or when they cannot get together at the same time.

  - Multimedia presentations provide an arena for all students to pool their strengths in the skill areas of making video clips, scanning images, digitizing sound, creating animation, and writing text.

- Interdisciplinary learning

  - Research on multiple disciplines can be retrieved from many sources including texts, online research, and online discussions with experts.

  - Powerful tools, such as spreadsheets, coupled with analytical thinking skills, allow students to examine data, pose hypotheses, and make predictions in a variety of disciplines.

- Individualized learning

  - Technology with adaptive and assistive devices may provide special populations with the opportunity to participate fully with their classmates.

  - Computer-based tools can be used to develop visual, kinesthetic, aural, and oral skills, and to enhance compatibility of instruction with individual learning styles.

Student Technology Standards

New 21st century "common core" skills for all students reconsider the concept of learning being separated into specific discrete content areas (i.e., math, social studies, language arts) and embrace cross-cutting competencies that need to be incorporated within each discipline. See Figure 2.
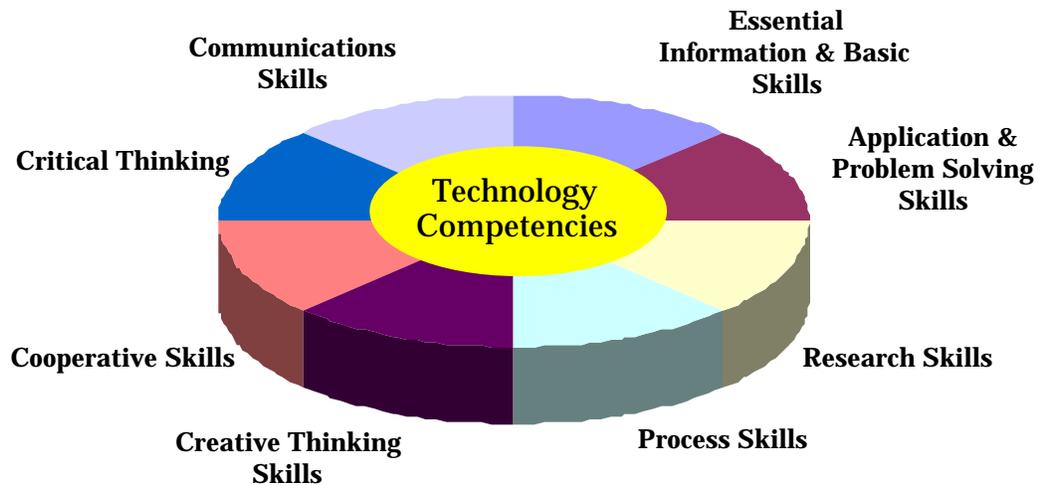

Figure 2: New Common Core Skills

In very real and distinct ways, technology can assist learners at various developmental stages. However, in order to take advantage of developmentally appropriate, technology-enriched lessons, an approach for integrating technology into the curriculum is recommended. The district must first embrace a set of technology competencies. Core technology competencies serve as standards and benchmarks in identifying the specific technology skills that LAUSD students must possess in order to acquire the new basic skills for the information age - the ability to access, analyze, and communicate information. In mid-November 1999, ISTE published and widely disseminated the National Education Technology Standards (NETS), *Connecting Curriculum and Technology*. In that month, the LAUSD Instructional Technology Applications Facilitators (ITAFs) advocated adopting the NETS standards district-wide and developing strategies for integrating these standards into the district's curriculum. The conceptual model selected by the ITAFs to represent this idea of technology skills as a common core area enhancing, along with other common core skills, teaching and learning in all disciplines is shown below in Figure 3.

Common Core

Technology Competencies

Skills

Science

Mathematics

Social Studies

Language Arts

World Language

Arts

Health
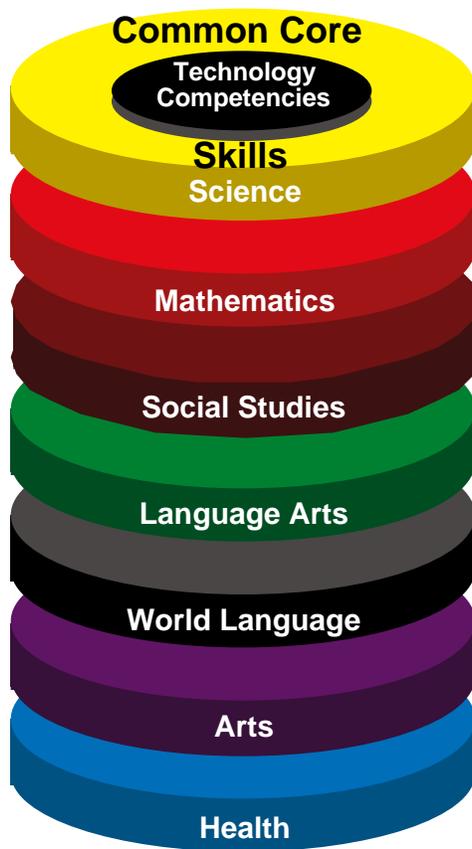
Figure 3: Technology Competencies

The NETS Technology Foundation Standards for Students is available for review in Appendix A of this plan. These standards are divided into six broad categories:

- Basic operations and concepts

- Social, ethical, and human issues

- Technology productivity tools

- Technology communications tools

- Technology research tools

- Technology problem-solving and decision-making tools

A more detailed report on student technology standards is provided in the CELT document *Report on Student Technology Competencies* produced for LAUSD in December of 1999. Included are performance indicators for pre-K-grade 2, grades 3-5, grades 6-8, and grades 9-12, as well as a planning matrix for identifying technology milestones.

Figure 4: Curriculum/Technology Integration Approach
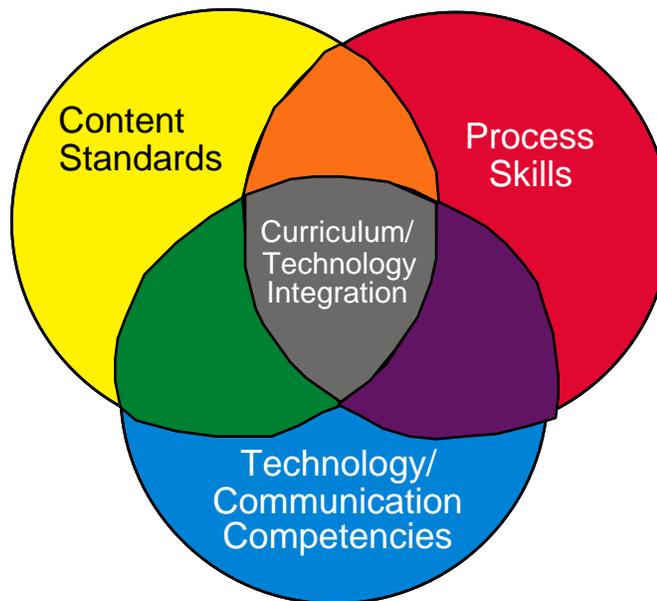
LAUSD should consider the design and implementation of a web-based relational database to accommodate the preK-12 student technology standards, linkages to technology resources, and identified connections to established academic standards. This database should be expanded over time and become highly accessible and searchable by teachers at all levels and in all disciplines as a reference for implementing the technology standards with academic learning standards. The district has considered the selection of core technology standards as a graduation requirement, once sufficient resources are in place to ensure equity of access for all students. It is important that the district establish appropriate benchmarks, performance measures, strategies for remediation, a central tracking system, and effective communication channels to achieve accountability in implementing the core technology standard requirements.

Curriculum and technology integration can best be described as the alignment of LAUSD content standards with the cross-cutting competencies in technology and problem solving so that *students and teachers learn about technology by teaching and learning with technology*. Core technology competencies provide the direction for infusing technology tools and resources into appropriate curriculum areas. An Integrated Unit Plan (IUP) model can assist LAUSD teachers with the curriculum/technology integration process by ensuring equity and access to fundamental technology competence. This model is described in Figure 4.

An IUP targets LAUSD's content standards, student technology competencies, and other appropriate crosscutting competencies simultaneously within specific subject areas.

Westward Ho!, a sample IUP presented in Appendix B, uses the study of westward expansion as a framework for addressing social studies standards, research skills, and also writing and communications skills for grades 4 or 5. A *Guidebook for Developing Integrated Unit Plans* was developed by CELT Corporation in December of 1999 for LAUSD with the input and oversight of the ITAFs. Recommended IUP components, strategies for IUP development, and quality assurance and approval guidelines are included in this document.

Individual integrated unit plans can serve as maps for the development of curriculum packages that guide daily instruction in LAUSD schools. Development of IUPs can be a major staff development activity for improving teacher capacity in curriculum/technology integration. Teachers not directly engaged in developing IUPs can nonetheless benefit greatly from reviewing and adopting IUPs that have been approved. A resource bank of approved IUPs can become a very valuable resource for integration models. The models can be searchable by grade level, discipline, learning standard, technology competency, or even key words.

Over time, the successful alignment of curriculum and technology through the use of such models as the integrated unit plan brings about observable changes in teaching and learning environments.

At-Risk Students

Technology can enhance the success of all LAUSD programs and play an instrumental role in meeting their goals. It can support important activities, such as implementing a program's evaluation and student monitoring system. A critical area of need for technology integration in programs is in the support of product indicators including tracking at-risk variables, student achievement, discipline records, attendance rate, and graduation rates for students' participation in specific LAUSD programs. Technology can also provide timely information regarding the numbers and types of students involved in a program's learning experiences, as well as teachers trained in different aspects of a program's support system.

As part of the technology infrastructure building process, the major critical information needs for staff in various LAUSD programs should be identified and prioritized. Identification and selection of a set of data for use by staff should occur, but this must be accomplished within the framework of a comprehensive student database. To ensure success, program staff must also have easy and daily access to hardware, software, technical training, and support. Revisions of the data set should be based on user feedback, along with a replication design for expanding the system to district-wide use. Implementation, monitoring and evaluation systems should be established to ensure quality, coordination, and goal achievement. Throughout the program implementation process, action steps should have clear linkages to the strategic goals of the district and the *Instructional Technology Plan.*

It is proposed that LAUSD research and disseminate successful strategies, programs, and models for addressing the needs of students at-risk from pre-K through grade 12 via the LAUSD web site by:

- Defining and identifying the district's at-risk populations
- Determining criteria for selecting at-risk populations that can benefit from technology enhanced interventions

- Aligning technology enhanced interventions with at-risk populations
- Creating and disseminating assessment strategies to align individual students at-risk with the most appropriate intervention

In addressing other at-risk factors, the district could increase access to LAUSD instructional technology resources by promoting partnerships with childcare service providers offering before school, after school, weekend and summer programming for LAUSD students. Further, appropriate access to student information within the district decision support system might be provided to childcare service providers offering before school, after school, weekend and summer programming for LAUSD students.

Assessment

A number of viable alternative assessment projects are ongoing throughout the district. Standardized testing, portfolio assessment, authentic assessments, project-based assessments, and peer evaluation models are among the localized options. Strategies involving Local District and school level staff would require the development of instruments and technology-supported procedures for evaluating the impact of the pilot projects and school-level initiatives in the area of assessment. The goal would be to expand those assessment strategies that have promise for improving student achievement. Action steps would include:

- Gathering both quantitative and qualitative data about the programs.
- Compiling the data and report findings.
- Creating a set of guidelines for potential district-wide implementation based upon study results.
- Reviewing assessment initiatives from a technical perspective to ensure that they can be integrated into the district's decision support system.
- Developing implementation guidelines and technical specifications for schools and Local Districts interested in embracing successful models.

Curriculum Development/ Learning Management

A curriculum development/learning management (CDLM) software system links curriculum with student information, instructional resources, and assessment strategies. This type of system can facilitate an orderly flow of large quantities of integrated information and have an impact on teaching, learning, educational management, and decision making at all levels. LAUSD educators can use a CDLM technology to articulate and catalog learning goals (e.g., content and performance standards and benchmarks, etc.) and crosscutting competencies as they relate to selected curricula. Once standards, benchmarks, and competencies have been electronically catalogued, a CDLM system will highlight learning resources as they support teaching processes, and will provide a focus on strategies that will lead to student achievement of each benchmark.

As illustrated in Figure 5, multimedia, software, books, manipulatives, etc., can be correlated to specific learning goals with a comprehensive description as to the use of such materials. Teachers can document, record, and electronically share units and lessons that have been successful in achieving desired student performances. The correlation of performance to instructional resources will shift the emphasis away from a curriculum dictated by the textbook to one encouraging inquiry and the development of lifelong learning skills (constructivism). The textbook now becomes only one of many resources available to assist teachers in reaching the student educational goals reflected in the CDLM system.
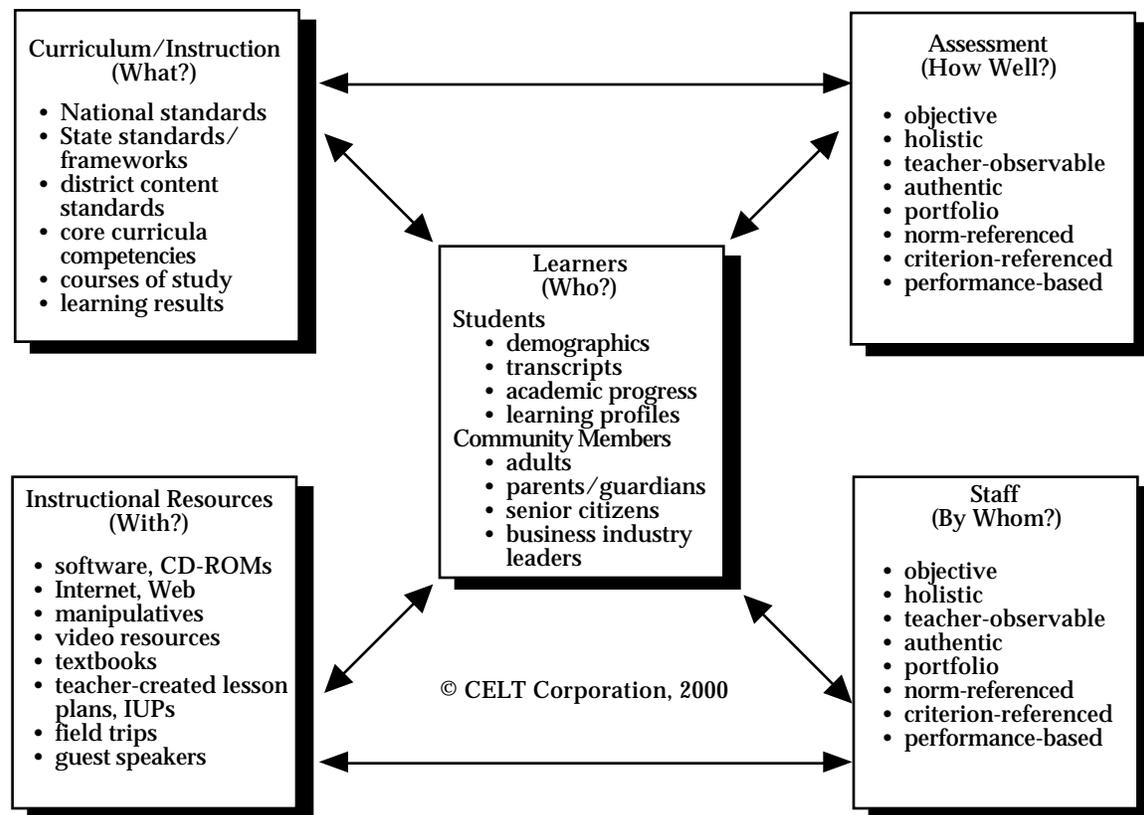
Figure 5: Technology in Support of Curriculum Development/Learning Management

With a CDLM technology in place, student assessment can be correlated to performance measures. CDLM software can record multiple assessment indicators (i.e., the SAT-9, on-demand performance, and authentic classroom-embedded assessment measures) and link them to the district content standards and benchmarks. A CDLM system will also enable educators to create banks of test items and catalog other evaluation methods (e.g., holistic scoring, teacher observable assessment, portfolio/authentic assessment, etc.) against desired student performances. Assessment reports generated by CDLM software are varied, offering detailed information to parents, teachers, and students, and can assist the district in establishing district-wide report card standards while offering Local Districts and schools the flexibility to customize certain reporting components.

Using CDLM technology, educators and parents will be provided with comprehensive profiles of student performance against designated performances for the duration of a student's enrollment in the district. A rich variety of information made available to teachers, administrators, and parents through CDLM will enable them to determine which learning methods, resources, and student assessment measures are contributing most to student attainment of LAUSD's academic content standards and benchmarks.

Currently, LAUSD is engaged in the development of a powerful decision support system to meet a variety of administrative and instructional needs. The district should integrate into the proposed decision support system a curriculum development and learning management component that will:

- Be easily accessible to teachers and administrators at the classroom, school, Local District, and district levels

- Use a relational database architecture

- Link curricular information (e.g., content standards, performance standards, etc.) with learning resources, student assessment, and student information

- Monitor the alignment of instructional resources to district standards

- Enable educators to record and share the alignment of content standards, benchmarks, performance standards, frameworks, and cross discipline competencies

Steps for acquiring and implementing the curriculum development/learning management system would include:

- Clearly defining for administrators and educators the intent and purpose of the system for improving instruction.

- Developing functional and bid specifications for the CDLM component in accordance with identified district needs and with full compatibility with other applications (student information, human resources, etc.) in the decision support system

- Procuring, implementing, and testing the curriculum development/learning management system in a pilot setting.

- Implementing the curriculum development/ learning management system across the district

- Providing training and support for maximum utilization of the CDLM system

Funding Approaches

The district must establish a baseline for technology at school sites. Most importantly, LAUSD must supply that technology to schools and provide for maintenance and updates of the equipment and necessary software.   Schools developing special programs that require additional technology resources will be able to take advantage of various initiatives, some of which are described below.

As of the Spring, 2000, all of the high schools will be participating in the Digital High School program. This state initiative grants high schools (initially) $300 per student to develop curricular reform efforts through the use of technology.

The district has been successful in accessing opportunities for federal, state, and local grants and entitlements as well as private funding opportunities. Potential funding opportunities need even further expansion if LAUSD is to provide equitable and effectual technology supported instructional activities for all of its students. Effort should be made to expand the Grants Assistance web site.   The web site should contain links to federal, state, and local grants and entitlements for technology resources and initiatives. Strategies for finding and applying for "special audience" grants need to be identified. Individuals/agencies with the skills to develop competitive grant applications should be engaged by the district. Workshops and seminars on successful grant development should be conducted at regional training centers. School, Local District, and district staff should regularly check web sites for grant opportunities

To enable grant writers to obtain pertinent information to facilitate the preparation of numerous grants, the Grants Assistance Office should locate standard grant elements on the district web site for easy access during the grant development process including:

- District priority areas
- Technology mission, vision, and goal statements
- Strategic improvement plans
- Needs assessment results and data
- Learning standards and technology competencies
- Fiscal information

Curriculum and technology will play an unquestionably crucial role in the futures of LAUSD children. Experts from many disciplines echo the sentiments that technology should and can play an important role in curriculum planning, development, delivery, assessment, and administration in fostering student academic excellence.

3.0   TECHNOLOGY ENHANCED LEARNING ENVIRONMENTS

Nobody would ever think to share a single textbook among 30 students, and we still have classrooms where we are lucky if there's more than a single computer in the classroom.

—Linda G. Roberts, Director of Technology

U.S. Department of Education

Selecting realistic and appropriate technology learning environments designed for the primary to adult learner to address district learning needs and priorities is of critical importance to LAUSD. The topics addressed within this section are:

- Equity of Technology Resources
- Learning Environments
- Libraries
- Facilities

3.1   Rationale

Curriculum decisions should be the driving force behind the selection and purchase of hardware, software, and network solutions. Schools embracing this strategy in technology planning will develop a unique, meaningful, and shared vision and a pathway to achieve desired results. There are many technologies that have the potential to facilitate learning. Likewise, there are many ways of organizing the technologies and many approaches for using the technology at different school levels (primary, elementary, middle, and high school). This technology plan proposes strategies to effectively align curriculum with technology enhanced learning environments and seeks to attain equity of technology resources throughout the district.

3.2 Major Findings

There are significant inequities of student access to technology and to instructors trained in curriculum/technology integration among schools and Local Districts in LAUSD. The distribution of technology funding resources across the district is uneven. Entitlement grants and other resources for technology are available to some schools but not others. Technology Challenge Grants have provided equipment for many schools at the elementary and middle school levels, but not in all classrooms. Principals and site-based management groups play a pivotal role in advancing the acquisition of technology resources in their schools.

Elementary school libraries are neither funded nor staffed to serve as information resource centers for the schools. Efforts for automating secondary school libraries have been ongoing for about a decade. A comprehensive bond (Proposition BB) has been passed for the upgrade of school facilities, addressing network infrastructure, electrical power, asbestos abatement, security, and HVAC issues at all schools. Proposition BB is being coordinated with the federal E-rate discount program. Each school is scheduled to receive a local area network capable of accessing the Internet, receiving interactive video and, even, delivering telephone access to classrooms. The district's Internet service, LAUSDnet, provides an extensive wide area network (WAN) with over 80,000 e-mail accounts and an access rate of over 1,800,000 "hits," per month on the web site. The federal E-rate program is enabling the district infrastructure to expand in support the increased use of technology at schools. Schools within LAUSD continue to embrace both Windows and Macintosh platforms.

3.3 Major Initiatives

Equity of Technology Resources

- Procure equipment for classrooms and other learning environments in accordance with established standards, allocation programs, and critical mass guidelines.

- Establish electronic access to appropriate informational and learning resources at school from home and community centers.

Learning Environments

- Develop a master procurement/allocation plan for achieving the goal of one computer for every six students.

- Expand the availability of portable computers to as many teachers as possible.

- Communicate information to principals and teachers regarding low-cost desktop computing devices and their potential application to learning standards.

Libraries

- Implement model school libraries throughout the district, transforming libraries over time to serve as information resource centers for students and staff.

- Expand successful models and practices regarding library-based resources.

Facilities

- Ensure that guidelines for school facilities upgrades are current and will accommodate appropriate instructional technology throughout school buildings and take into consideration differences in teaching and learning needs among elementary, middle, and high school students and students in special programs.

- Standardize the local area network (LAN) specifications providing adequate security for all network components, including routers, switches and servers.

- Through the integration of Proposition BB and the federal E-rate efforts, ensure the delivery of efficient Internet and interactive video access to all district schools.

- In existing buildings, find ways to increase the security of technology in classrooms and labs, especially after school hours.

3.4   Implementation Approaches

Equity of Technology Resources

Acquisition and management of technology resources address both access and equity issues. Access refers to the students' ability to use instructional technologies to enhance/support learning about and with technology. Access is linked to several important variables:

- The number of computers (generally evaluated in terms of a student-to-computer ratio)

- The location, configuration, and scheduling of technology resources

- The use of networking and/or telecommunications to transcend classroom and school geographical boundaries

- The proficiency of teachers and administrators who can support and guide instruction

Acquisition deals with the funding approaches and decision-making processes by which schools acquire instructional technology resources.

The efficient acquisition and management of technology resources will help ensure that:

- Schools are provided with equipment that meets or exceeds district standards

- All students have access to current, appropriate, and sufficient information resources

- Existing resources are used to their maximum potential so that future dollars are spent in areas of greatest need

- All schools attain a sufficient infusion of instructional technologies to attain district goals through local implementation solutions

LAUSD must define and embrace approved "critical mass" configurations for classrooms and learning environments at all levels. (Critical mass is defined as that level of technology infusion sufficient for measurable gains in student performance.)

Reaching critical mass in technology resources for the district means that over the course of the next three budget cycles, student-to-modern (multimedia) instructional computer ratios will be 6:1 or one computer for every six students.

This ratio is not ideal. However, it is a baseline upon which schools and Local Districts can build to meet their individual needs.

The district should analyze and monitor current school and Local District progress toward critical mass utilizing an inventory database populated by information from the inventory surveys that are provided annually. ITAFs should assist in the validation of these surveys. The survey instrument should ultimately become a web-based data-gathering tool coupled to a district-wide online inventory database with electronic search capabilities by each school office.

Local District and District level reports should be created from both the inventory database and a future procurement system that depicts the distribution of quality resources, provides schools and Local Districts with comparative data, and flags inequities. Principals, Local District leadership, and ITAFs should be involved in the design of useful reports. The deployment of assistive/adaptive devices for special needs populations should be included in analysis and reporting procedures. The task of auditing and monitoring equitable access to technology resources should be assigned at the Local District level.

The STaR (*School Technology and Readiness*, CEO Forum) report currently identifies the following student-to-computer ratios for "Target Tech" schools for those with technology-rich environments: two-to-five students per computer (all types) and five-to-eight students per multimedia computer. Hence the *Instructional Technology Plan* establishes critical mass within reasonable expectations for high performing school districts.

Without attaining critical mass (a sufficient level of infusion) of technology resources accompanied by training, support, building-level leadership and vision, and effective planning, the district may realize limited measurable gains in student performance from implementation of the LAUSD technology planning efforts. Accordingly, the district must develop a master procurement/allocation plan for achieving the goal of one computer for every six students, the equipment to be located predominantly in classrooms and the library/media center, while simultaneously upgrading or replacing obsolete equipment.

The district leadership has expressed the need for expanding home/school communications as well as availability of educational resources through electronic linkages to families with access from home, community centers, and libraries. The district needs to consider the implications of resources and determine appropriate instructional resources to be made available for after-hours student access and for community access. Planning should be accomplished to initially improve and maintain web sites at the district, Local District, school, and even classroom levels. Web-based strategies for community access and dissemination need to be developed. Information and resources will need development in several languages. The purpose and value of expanded communications needs to be widely communicated. Information regarding availability of information and educational resources as well as directions for access must be publicized. Initial educational resources should be targeted to improve literacy skills.

Learning Environments

The primary purpose of placing computers in classrooms is to improve the teaching and learning process while simultaneously addressing the equitable distribution of technology resources for all students. With only a single modern presentation workstation connected to the school LAN and a computer projection system, teachers would be able to access and use technology to enhance their teaching. With multiple computers in classrooms and libraries, students can regularly access computers and software to enhance their learning in conjunction with their daily course work. Computers placed in classrooms should be arranged according to the teaching styles appropriate to each grade level and subject area. Configurations that best support the specific needs of each small learning community (i.e., special program, specific discipline,) must be considered.

Computers should be moved from labs to classrooms as much as possible, preserving labs only when appropriate to learning needs. Existing technology should be replaced or upgraded when it no longer enhances the teaching and learning processes in classrooms or labs. A district-wide purchasing schedule for new computers should focus on providing an equitable distribution base of these resources.

The document *Technology Enhanced Learning Environments* produced for LAUSD by CELT incorporates design templates that support the variety of learning/teaching needs at the elementary, middle, and high schools, and for school libraries.

At the school level, curriculum decisions must be the driving force behind the deployment of technology. Learning environments will be designed to support a range of instructional activities appropriate to the developmental needs of the learners, staff competencies, education reform initiatives, and specific technology applications.

Utilizing the *Technology Enhanced Learning Environments* document as a communications tool, accessible to all schools and upgraded regularly, the district could offer prototypes for the following learning environment modules to assist schools and teachers in developing multiple strategies for building environments that best support their curriculum approaches:

- Teacher workstations and presentation devices

- Individual classroom computers with task-specific peripherals

- Portable computing devices (text processors, graphic calculators, etc.) for content-specific activities

- Instructional technology "pods" of three-to-five computers

- Instructional technology and vocational laboratories of twelve-to-thirty computer workstations

- Libraries/information resource centers

- Distance learning centers

LAUSD educators should take care to match potential learning environment configurations to the types of learning or instructional activities that will take place in each setting. For example, schools that currently support a computer lab approach should reconsider the established configurations to determine if they provide effective cooperative learning environments. It is important that schools remain in control of local decision making regarding technology options that reflect the unique needs and goals of the school community and the existing learning environment. However, information resources or other support from ITAFs in making decisions regarding wiring, Internet drops, computer locations, furniture, or other environmental issues should be readily available. School personnel will need to consider how to deploy appropriate resources (e.g., hardware, software, technology, support services) effectively in order to maximize the benefits of the entire technology system. The equitable distribution of the technology resources throughout the schools will enable all students, teachers, and administrators to function more effectively.

Figure 6 diagrams technology learning environments with the library/information resource center as the hub.
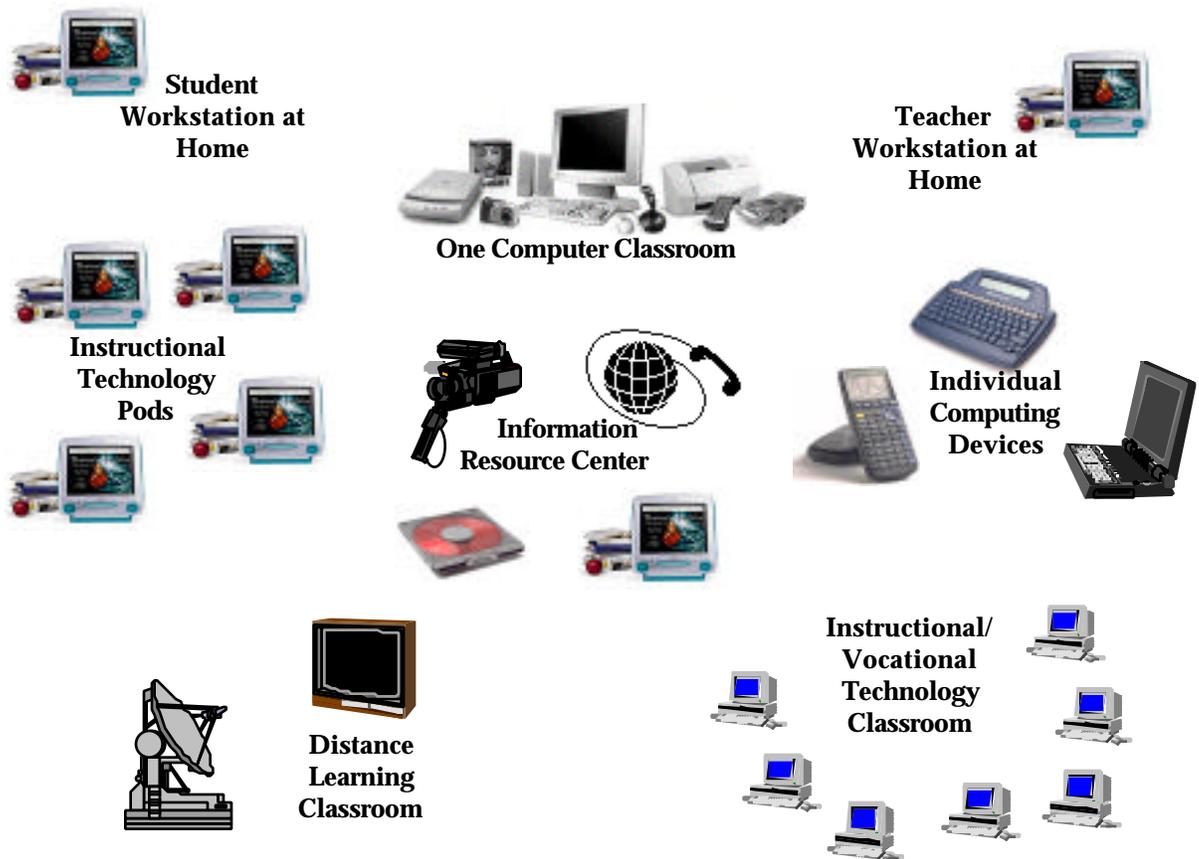
Figure 6: Technology Resource Environments

Alternative low-cost desktop computing devices have proven to be effective in helping the district address specific learning standards, especially those related to writing and communications skills. The resource mentioned earlier, *Technology Enhanced Learning Environments*, offers additional information on alternative computing devices, such as portable writing keyboards, graphing calculators, and portable computers. The district should develop and maintain up-to-date hot links from the electronic version of this guide to vendor sites and schools sites describing successful implementation stories and strategies. The district may also identify mentor teachers who have used these devices and are willing to work with others to facilitate effective integration into classroom activities. This mentoring can be coordinated through the Local District ITAFs and be provided remotely via e-mail.

The district could also coordinate vendor demonstrations of this equipment at convenient sites throughout the district and negotiate high volume purchases for all LAUSD schools. Procedures and pricing for securing alternative computing devices should be distributed to all schools

A highly effective approach to enabling teachers to improve productivity in their professional tasks as well as in their instructional delivery is to provide them with portable computers for use in the classroom and at home. Voluminous research has indicated those staffs who use computers in their daily lives and/or professions are highly likely to use them effectively with their students. Many districts have provided teachers who undertake appropriate staff development activities or who otherwise have obtained specific technology competencies that ensure effective use of the equipment. In some districts, a portable computer has been designated as the "classroom" unit that can be used for full-class activities, demonstrations, or access to district e-mail or other important information resources. Although this may not be an economically feasible approach for LAUSD at this time, measures should be taken to encourage availability of portable computers to all staff. The Instructional Technology Branch should research and communicate recommended choices for portable computers and built-in software. The district could negotiate favorable pricing from vendors for portable computers that have prescribed capability to use applications standards to the district, to communicate effectively with district information systems, and be able to access the World Wide Web.

After establishing and communicating minimal standards of equipment, LAUSD should research interest in and feasibility of incentive approaches for teachers such as:

- Payroll deduction for the purchase of computers

- Shared cost between teachers and LAUSD

- District applications software licenses expanded to enable loading onto staff equipment

- Teacher loan programs at school-sites

- Lease/purchase options for teachers

- Free computers to teachers who acquire all staff technology competencies identified for their position

If interest and feasibility are established, the district should accordingly initiate activities to acquire portable computers for staff. Strategies for monitoring the use of portable computers by teachers as well as for measuring the impact of their use on pre-determined variables should be developed and carried out.

Libraries/Information Resource Centers

District leaders and secondary school librarians share a vision of school libraries being the hub of information access in a school building. This vision is less prevalent at the elementary level where libraries have often been converted to classrooms to help reduce class size. Librarians, paraprofessionals, and volunteers are often required to cover planning/preparation time for teachers.

If libraries are to survive and grow into information resource centers, the district needs to reaffirm their critical importance. District-wide, libraries should also become a priority in the networking process and be upgraded with enough appropriate technology to enable them to provide Internet access. The planned E-rate/Proposition BB infrastructure will enable libraries to support voice, video, and data (electronic and hard copy) information resources. Additionally, while many of the existing library and media facilities have structural, electrical, and spatial constraints, schools designated for renovations should place a high priority on creating such centers.

Some LAUSD libraries not only provide resources locally, but they also enable students and staff to access learning materials from across the country and the world. As more libraries become automated and Internet connected they, too, will have these components:

- Locally warehoused books, papers, photographs, software, videos, and CD-ROMs

- Electronic virtual library access systems by which a user may transparently connect to remote libraries, databases, and other remote holdings by using the school library's online system

In order to be transformed into information technology resource centers that support voice, video, and data (electronic and hard copy) information resources, libraries require an automated and comprehensive library media management system that operates over the district's information technology system. LAUSD also needs to ultimately migrate to a comprehensive media management system. This would enable students, teachers, and administrators to access information resources over the network, search databases, reserve video resources, and request information sources. Key to the success of the 21st century school library is its access from any workstation in the building via the network. Also, information-processing tools should be employed to transform information into more readily usable formats.

To assist Local District and school leaders, a task force could be formed to address the following strategies for automating school libraries system-wide:

- Research the feasibility of the library system being a central, administrative function similar to other administrative functions (e.g., e-mail, financial, and student information) and compatible with the student information system

- Move the library automation systems to a uniform client/server software application in a WAN environment over time

- Define the platform and purchase library management software centrally and then implement and maintain it centrally

- Provide equitable access to students and staff to information available over the network (e.g., district learning resources, approved web sites, L.A.'s public library system, and accessible university library systems)

- Develop and implement a plan and timetable for the automation of all school libraries

- Develop and implement a plan and timetable for establishing a comprehensive media management system

A district-wide school library system would minimize unnecessary duplication of holdings across schools, allowing individual libraries to develop specialized, in-depth collections. By electronically linking all the districts' school libraries, these specialized, in-depth collections would be accessible to any student, teacher, or administrator.

In addition to addressing automation challenges, the task force should also focus attention on promoting effective library models, providing professional development, and sharing practices and resources. The task force should:

- Help ITAFs communicate to school leadership the important role of libraries as information resource centers now and in the future

- Provide Local District and school leaders with model configurations for technology-enriched learning environments for libraries

- Ensure district-wide professional development plans and programs for school librarians and paraprofessionals to prepare them to manage technology rich information resources, and help students and staff use technology as a research tool

- Assess success and replicability of existing library-based models, practices, and resources, and expand the use of successful programs

- Design resources to be web-enabled and accessible by all computers at all school sites, and as appropriate, from home and community centers

LAUSD schools need to negotiate site licenses with publishers of electronic versions of their books and other print matter. This will enable teachers and curriculum developers to access these electronic books and periodicals and assemble customized, standards-based, teaching materials for use in the classroom. The district network has access to a variety of online databases such as ERIC for use by educators for professional development or classroom activities. Full text is available from many sources and can be stored on the area/district server for easy access by school building personnel. Teachers and students can have access to current news for research projects. With access to commercial news services, students will be able to search and browse over sixty newspapers, over 200 periodicals, and live news reports from sources such as the Associated Press.

Students must also be able to:

- Access electronic card catalogs and bibliographic databases within and among schools

- Perform interlibrary loans, both among schools and with public library facilities

- Access library databases within the school, at other schools, and at district offices

In addition, current cataloging can be improved to increase efficiency and accuracy. Books may be purchased that are ready to be placed on shelves along with accompanying cataloging information in electronic form. Where this is not possible, and for non-print items, a fully networked catalog processing service should be implemented.

Facilities

Many schools are already wired with most computers attached; others have very few computers and no network. The benefits of networking computers, both instructional and administrative, cannot be ignored. Electrical service into and within schools is, in numerous cases, inadequate to handle the increased need for electrical outlets and wiring for computers and networks in classrooms and in other learning spaces. Facilities upgrades in accordance with the E-rate/Proposition BB specifications are addressing these obstacles.   The collaboration between the E-rate program and the Proposition BB effort is critical to ensure that schools are wired more quickly than in the past. The district must ensure that computers are on school-wide local area networks (LANs) in the very near future.

A Technology Standards Committee established to address hardware, software, and networking standards district-wide, should regularly address technology standards school and classroom configurations.

ITAFs should work with teams that will conduct site-visits to schools in advance of LAN installation to work with building leadership in identifying appropriate locations for networking equipment and drops into classrooms, libraries, and other areas. These teams should help schools determine the appropriate placement of network components in order to provide the best environment at the least cost.

The district should develop web-based guidelines and necessary funds to enable schools to protect their networking components environmentally. School leadership should be encouraged to visit exemplary technology infusion sites within the district.

LAUSDnet must be upgraded continually so that the wide area network (WAN) will be sufficiently robust to accommodate a "voice/data/two-way video network." If the network is deficient, it could be an impediment to instructional technology and professional development activities in the near future. Development of an alternate district WAN would be an expensive undertaking. The Information Technology Division should identify requirements and procedures to deliver efficient Internet access and interactive video either through LAUSDnet or develop a separate network. The division should review audit report recommendations and develop a strategy to ensure capacity for delivery of interactive video district-wide.

The district must ensure that all planning arising out of any facilities upgrade initiative clearly encompasses any approved recommendations contained in this plan. As mentioned, adequate power, space, and HVAC must be planned to accomplish the desired technology infusion into classrooms and office spaces. Adequate security is an another important consideration to be addressed.

Security issues cover three major areas: physical security of facilities (e.g., intruder alarms), physical security of technology components (e.g., theft of components), and data/network security (e.g., protection against hackers). The following recommendations address each of these areas in turn:

- *Facility Security*: **Perform a needs analysis to develop the functional requirements and specifications for a new security system that includes video monitoring of facilities and is network-based.**

- *Technology Component Security*: **Determine a method to collect and disseminate security strategies for such issues as the loss of mouse balls and other minor vandalism. Allow for the posting of problems and group interaction to develop new strategies.**

- *Data/Network Security*: **Although current security provisions are effective, to deal with future growth in both number of users and number of applications, policies and procedures on access and security should be developed and disseminated.**

Network security in a preK-12 environment that is connected to the Internet is more complex than in many other types of organizations. Not only must LAUSD contend with potentially destructive attacks from outside and within the organization, but it must also avoid the appearance of encouraging access by minors to material that the community may find objectionable. Security requires policy and the technical means for implementing it.

Some of the most difficult and time-consuming work in the implementation effort may be in developing a comprehensive set of policies and procedures. These should define:

- Expectations for proper computer and network use

- Procedures to detect, prevent, and respond to security incidents

Additionally, a risk assessment should be performed that would identify assets and threats. Security is not absolute and comes at a cost. Cost can be measured in dollars for hardware, software, and staff time; but it can also be assessed in terms of loss of ease of use. The cost of guarding against a potential threat must be weighed against the cost of recovering from it.

The implementation of a security policy presents the following series of conflicting design goals in that:

- The network should be easy to use, yet security measures increase difficulty

- People should have access to appropriate information everywhere, but should be restricted from sensitive or confidential information

- The system should have good performance, but security checking imposes time and performance penalties

The district should authorize and allocate funding to allow schools to upgrade their security systems to incorporate protection for computers, peripherals, and other technologies wherever possible.

Schools may improve the security of technology by:

- Installing theft deterrent devices on computers in classrooms

- Expanding intrusion alarm systems with more zones and adding dial-up capabilities to security staff/central control

- Ensuring that video surveillance covers all areas in which newly acquired technology is concentrated.

This section of the technology plan is designed to aid the LAUSD with procuring, distributing, configuring, connecting, securing, and maintaining a modern collection of technology enhanced learning environments throughout the district.

4.0   HUMAN RESOURCE MANAGEMENT AND DEVELOPMENT

It is now well understood that the challenge of integrating technology into schools and classrooms is much more human than it is technological. What's more, it is not fundamentally about helping people to operate machines. Rather, it is about helping people, primarily teachers, integrate these technologies into their teaching as tools of a profession that is being redefined through the incorporation process.

—K. Sheingold, "Restructuring for Learning with Technology:

The Potential for Synergy"

Human resource management and development addresses the professional development, organizational issues, and support services that are essential to technology integration. The topics addressed within this section are:

- Staff Technology Competencies and Staff Development Planning

- Organizational Development and Human Resource Management

- Technology Support Staffing

4.1   Rationale

Ongoing training and reliable technology support services are essential if all teachers and instructional staff are to incorporate appropriate technology resources into teaching and learning. The effective management of technology enhanced learning environments requires that teachers be provided with training and ongoing support to artfully select and utilize the technology resources that can best address the learning standards, critical mandates, and individual learning needs of the their students.

Professional development is the formal means by which LAUSD promotes the continuous learning and improvement among teachers and instructional staff. Many district, Local District and school leaders recognize that reactive training interventions and stand-alone workshops cannot keep pace with the formidable standards and mandate-driven development needs. It is clear that efforts need to be coordinated and focused on high priority needs, and that technology must be routinely integrated into the content, delivery, and management of professional development.

LAUSD leaders understand that professional development requires a three-phased process of education, training, and support. "Education" builds vision and awareness; "training" develops specific knowledge, skills, and behaviors (competencies); and "support" provides the ongoing reinforcement and assistance required for sustained learning. The foundation for effective training is competency-based professional development planning. The identification of technology competencies, along with other instructional competencies, will help to align professional development with critical priorities directly related to improved student learning.

Another essential component of successful integration is adequate technology support services. LAUSD is so large that many of these support services need to be decentralized and/or outsourced to meet the growing demands of more users at the Local District and school levels. It is important to set district-wide guidelines and identify funding strategies to ensure that all instructional staff, and the students they serve, are provided with reliable support services to maintain and repair technology resources and coordinate upgrades and procurement.

4.2   Major Findings

In the Fall of 1999, the ITAFs collaborated on a draft of teacher technology competencies, with performance levels drawing on state and national resources and guidelines. These teacher technology competencies, which are included in Appendix B, once the Instructional Technology Plan is adopted, can be used to assess high priority training needs and plan technology-related professional development. Technology competencies for school and Local District leadership also need to be identified and addressed to enable them to effectively model technology use and to evaluate the success of integration efforts of their instructional staff.

The approach to technology-related staff development has been fragmented among the Professional Development Branch, the Information Technology Division, the Instructional Technology Branch, and school-based efforts. Much district-provided staff development has also been linked to specific grant funding. The Digital High School program and upcoming Digital Middle School has much promise to provide equipment and training for staff. A major focus of current LAUSD professional development efforts is the improvement of student literacy skills. However, ways in which technology can be used to support this priority has not been fully considered. It is recognized that to train LAUSD teachers effectively in technology integration, the use of the Internet for online courseware, and the establishment of viable interactive video training will be important.

There are not clearly defined expectations among the various organizational units regarding functions, roles, and responsibilities for support services related to school level technology integration into teaching and learning. The district has established the Local District-level Instructional Technology Application Facilitator (ITAF) position. The impact of this position in providing guidance and resources to schools has been very positive. However, school-based technology support remains as an ongoing critical need. Decisions regarding library-media staff are site-based. With notable exceptions, library/media staff, at most schools, are not currently a viable resource for instructional technology support.

4.3   Major Initiatives

Staff Technology Competencies and Professional Development Planning

- Identify and adopt district-wide technology competencies and performance levels for teachers, instructional staff, principals, and Local District leadership.

- Identify and implement a district-level comprehensive professional development planning model to enable more effective coordination and collaboration among various branches and groups that provide training.

- Set and communicate district-wide expectations for Local District- and school-based technology training for developing staff technology competencies.

- Develop and implement technology-supported delivery systems for professional development that accommodate the needs of large numbers of teachers.

- Develop and implement a competency-based Individual Staff Development Plan (ISDP) process and template.

Organizational Development and Human Resource Management

- Involve the Professional Development and Instructional Technology Branches, and the Information Technology Division in collaborative organizational development activities to improve coordination and communication.

- Engage in organizational development to clarify functions, roles and responsibilities for technology support services at the district, Local District, and school levels.

- Develop, as part of a district-wide decision-support system, the capacity to store, manage, and query personnel and competency-based human resource data.

Technology Support Staffing

- Continue to clarify the role of the new ITAF position and define the relationship of the ITAFs to the Local District, Instructional Technology Branch, and schools they serve.

- Based on the outcomes of collaborative organizational development activities, establish guidelines for school-based technology support services.

4.4   Implementation Approaches

Staff Technology Competencies

Identifying district-wide technology competencies and performance levels for teachers and other instructional staff was determined to be the first step in improving technology-related professional development. A draft of teacher technology competencies was developed that directly link to primary functions in order to provide a clear rationale and incentive for competency development. A sample survey instrument based on the teacher technology competencies was also developed. This instrument can be used to assess and prioritize technology-related development needs. The teacher technology competencies need to be formally adopted and systematically promoted by the district. Once the teacher technology competencies have been adopted, they can be also be incorporated into job descriptions, professional development programs, and supervision/evaluation practices.

Technology leadership from administrators is a critical component of effective change management. LAUSD needs to set expectations that all levels of administration will model technology integration in their daily functions and communicate to staff and parents how technology can help their schools address high priority improvement needs and district mandates. The Instructional Technology and Professional Development Branches, and ITAFs could collaborate on developing PowerPoint presentations for principals to customize and use to develop this shared vision. In LAUSD, the support of administrators is critical to communicating a shared technology vision and promoting successful technology integration in schools. Therefore, it is important to identify technology competencies for administrators. In addition to providing professional development activities focused on technology competencies related to administrative and management functions and personal productivity, structured opportunities that enable administrators to develop or enhance the following leadership-related technology competencies also need to be provided:

- An understanding of, and the ability to build and communicate a shared vision of technology integration as necessary to school improvement and essential to effectively addressing the district's priorities and mandates
- Supervisory skills in monitoring and evaluating teachers' and other instructional staff's integration of technology into major role-related functions

Because schools and departments do not currently have equal technology resources, it is important to align expectations for technology competency development to the level of access. For example, development of Internet research skills can only be expected of staff who have access to the Internet in their daily work environment.

Professional Development Planning and Programs

As evidenced by contemporary research and the LAUSD's aspirations for technology integration, educators must expand their view of professional development beyond the traditional workshops and beyond applications-only training in order to experience and model new behaviors for staff and students. The goal of technology-related professional development planning must be to empower administrators, teachers, and staff to integrate technology into curriculum/instruction and administrative/management functions. As staff become more proficient with technology tools and applications through targeted training activities, they need ongoing support and access to site-based technology support to reinforce learning and sustain their continuous improvement and development. Technology can be used to provide this on-going support in the form of e-mail communications, online tutorials, discussion groups, and access to online research and materials. LAUSD has provided this kind of ongoing support using

technology in the past, and these successful practices need to be resurrected, fully implemented, and sustained systemically.

Various groups within the district currently provide technology-related professional development, but the efforts are not coordinated. LAUSD needs to determine the scope of professional development services that will be provided at the district, Local District, and school levels. Further continuity can be promoted by adopting a planning model and process that promotes the alignment of professional development with the district priorities and mandates, and Local District/school improvement goals. In addition, an effective professional development planning model and processes will take into account how technology can be used as a tool to:

- Assess competency-based development needs and priorities
- Do market research and marketing of professional development opportunities
- Communicate opportunities for professional development
- Engage in ongoing collaboration, communication, support, and technical assistance
- Evaluate the effectiveness of professional development activities (i.e., the impact on teaching practices)
- Schedule, track, analyze, and manage professional development activities and data
- Provide confidentiality and security of human resource data

To promote competency-based professional development, video-based training models can include exemplars of what staff technology competencies look like when applied to daily instructional and administrative practices. In addition, some schools and Local Districts have developed successful models and practices for locally provided technology staff development, such as: collegial workshops, tutorials, peer modeling, coaching, mentoring, the development of student technology leaders, and distance learning options. These successful strategies and models can be shared online within and among Local Districts.

Strategic planning is the foundation for building a contemporary, competency-based professional development system that is grounded in the principles of continuous improvement. Competency-based professional development plans at the school, Local District, and district levels can be developed and implemented enabling all staff to focus professional development on critical mandates and high-leverage improvement goals. In addition, strategic planning and competencies linked to high priority needs and mandates help focus other competency-based human resource management initiatives, such as recruitment/selection and supervision/evaluation, as illustrated in Figure 7. For example, project and field-based assessment methods (e.g., portfolios, observation, 360-degree feedback, etc.) can be used to evaluate how staff are integrating technology competencies into instruction and administrative functions.
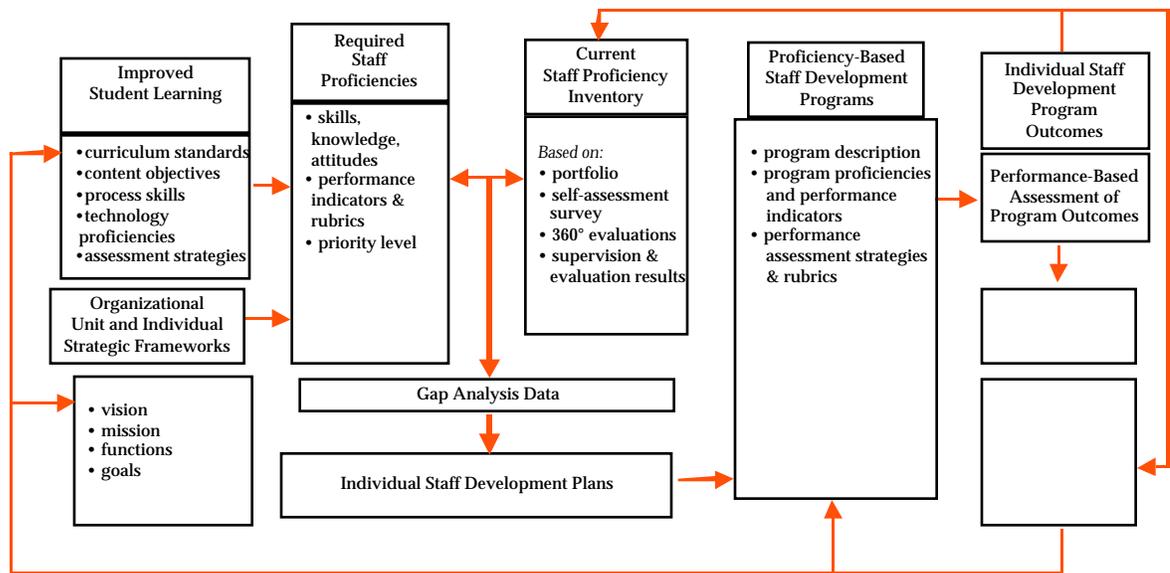
Figure 7: Competency-Based Professional Development Model

The competency-based, systems approach to professional development represented in Figure 7 is founded on the following beliefs:

- Every adult has the capacity to be a self-directed, lifelong learner when provided with quality development information and resources.

- Every adult has the capacity to design and implement effective, individual development plans that address growth and improvement priorities aligned with the strategic goals of the district and schools.

- Continual, systemic improvement is directly linked to the ongoing learning of all individuals and groups.

The model also recognizes the five stages of development outlined by David Dwyer and adapted in the Milken Professional Development Compendium:

- *Entry Stage* — staff struggle with the changes that technology brings to the work environment

- *Adoption Stage* — staff master new technologies at a basic level of understanding

- *Adaptation Stage* — staff recognize the potential of technology tools for personal productivity

- *Appropriation Stage* — staff master specific technology applications and integrates them into daily activities

- *Invention Stage* — staff mentor and coach others to expand technology skills across teaching and learning environments

To begin the transition to competency-based professional development, it is important to require that all providers of technology-related training *identify the targeted competencies and performance levels in descriptions for courses, workshops and other professional development activities.* **The program descriptions also need to identify any prerequisite competencies or experiences, and the minimum hardware and software requirement to ensure that participants will be able to practice their new learning upon return to school/work sites.**

The Professional Development Branch and other development planners at the Local Districts and schools need to use appropriate technology to schedule, promote, deliver, support, and track training activities. With leadership and support from the Professional Development and Instructional Technology Branches, all planners and providers also need to routinely use appropriate technology to support major mandates and high priority initiatives. For example,

- Teachers can be trained in the use of technology to provide and document multiple student assessments to help track progress toward promotion and gains in literacy

- How to use and manage classroom technology resources can be part of the classroom management module for beginning teachers

- The New Administrators' Academies can include clear expectations for technology competency development for school leaders and their staffs

LAUSD has more than 30,000 teachers that need training and/or ongoing support to improve student literacy. To meet this and other critical needs and mandates it is essential that the district expand technology-supported delivery options for professional development. Since there are viable models for online courses and development resources currently available, a good starting point is to identify these and provide Local District and school personnel with printed and/or online information on sources that could meet their technology competency development needs.

The next step would be to develop and implement a process for updating information on online courses and resources. At the district-level, it is important to identify higher education, community, vendor, and corporate partners for developing and implementing distance learning delivery models that focus on professional development priorities, such as student literacy. Competency-based professional development delivery options that can be researched and developed include:

- Online training and demonstration models

- Online courses and programs

- Two-way video conferencing

- Cable broadcasting

- Project-based learning with online coaching

- Online discussion groups

- Other models of asynchronistic learning

There are vendor provided online courses for developing technology competencies that can be cost-effective for large districts. Some focus totally on applications training, while others provide programs to support technology integration into teaching and learning. Some vendors have modules to support the development of technology leadership competencies. When conducting vendor programs, the following features can be considered:

- Flexibility of course delivery, e.g., delivery via CD, LAN, intranet, or Internet

- Customized grouping of modules

- Easy loading and removal of courses

- Linkage to technology competencies and performance levels identified by LAUSD

- Pre-assessment to determine the appropriate proficiency level or specific elements needed by learner

- Ability to enter and participate in short tutorials for "just-in-time" training in specific features of an application

- Clear alignment of integration training to curriculum standards

- Ongoing assessment and tracking of learners' progress, e.g., training management system based on interface standards for easy import and export of data

- Self-paced instruction

- Use of simulations and research-based models

- Ongoing support through online access to instructors and resources, e.g., discussion groups, frequently asked questions (FAQs), bulletin boards, etc.

Currently, LAUSD staff do not engage in multi-year development planning. The creation and implementation of a district-wide Individual Staff Development Plan (ISDP) process and template would enable strategic and collaborative planning between instructional staff and their supervisors. An ISDP approach will assist staff in identifying technology-related needs (and other competency development needs) and in linking these with appropriate professional development activities and delivery models. Incentive strategies should be explored to encourage and reward competency development. Consistent use of the template can help staff and supervisors focus on individual development needs that align with district, Local District, and school improvement priorities and strategic goals. If the template is electronic and searchable, data from individual development plans can be used to:

- Monitor "grassroots" professional development needs and plan development programs at district, Local District, and school levels

- Guide the design of professional development activities and programs

- Collect and share sample assessment strategies for various types of competency-based professional development activities.

Organizational Development and Human Resource Management

The Professional Development and Instructional Technology Branches, and the Information Technology Division have provided technology-related training. Coordination and communication among these groups can be improved by engaging in organizational development activities to:

- Clarify major functions, roles and relationships relative to professional development

- Determine critical interdependencies among the groups

- Develop strategies for using technology to assess professional development needs; promote and communicate opportunities; develop and deliver programs; manage development data; and, monitor and evaluate development activities

- Identify opportunities for collaborations on providing technology-related staff development

- Determine action plans for improving technology-related professional development services provided within LAUSD

Contemporary research indicates that sustained improvement and change require a comprehensive and systematic transformation of the manner in which schools organize and function. Many districts are struggling with the role technology can play to enhance organizational performance. Technology infusion is changing the roles and responsibilities for superintendents, principals, administrative staff, and classroom teachers. These changes have a profound impact on both staffing and organizational structure. In LAUSD, placing the appropriate number of people with the right skills, knowledge, and experience in the right places with the right tools, resources, and training is key to the success of implementation of the *Instructional Technology Plan*. It is also key to the ongoing operation and management of a comprehensive information technology system.

The introduction of the new position of Chief Technology Officer (CTO) presents an opportunity to involve representatives from the Instructional Technology Branch, the ITAFs, and school-based technology coordinators/specialists in organizational development work to clarify functions, roles, and responsibilities for technology support services at the district, Local District, and school levels. Spans of authority of different groups, critical interdependencies among groups, communication and collaboration protocols, reporting relationships, and standards of service need to determined or reaffirmed. Once these roles and spans of authority have been determined, charters can be developed and publicized to all internal and external customers/users to eliminate confusion about operating domains and responsibilities, and to articulate reporting relationships and communication paths among the three levels.

Technology Support Staffing

The new, Local District ITAF position is critical and will continue to evolve. Strategies to provide ongoing communication with Local District and school leaders and staff need to be developed and implemented as the role of ITAFs become clearer. The outcomes of the organizational development work described above will result in guidelines for technology support services at the Local District and school levels. To support the implementation of the guidelines, the district needs to develop:

- Multiple funding strategies

- Flexible models of technology support

- Samples of competency-based job descriptions for technology support positions at the Local District and school levels.

These resources will help administrators plan for changing technology support needs as more technology resources are acquired. If technology resources are to be effectively utilized, Local District and school staff need technology services to support instruction, administrative and management functions, planning and procurement, and maintenance and upgrades of hardware and software systems.

As technology spreads throughout the district and is increasingly used as a tool to enhance the instructional program, the role of ITAFs should be re-evaluated. The numbers of ITAFs may need to increase to support the new technologies. In fact, each Digital High School, with the large investment in technology at the school, should have the use of a "dedicated" ITAF to support that instructional program.

The influx of technology alone will not substantively improve student learning. LAUSD teachers and instructional staff need ongoing training and integration support if they are to effectively utilize technology resources to address standards and high priority learning needs. Professional development throughout the district needs to model appropriate use of technology in both the delivery and management of training activities. Guidelines for Local District, school-based, and outsourced technical support services to install, maintain, and repair hardware, software, and systems need to be established. District-wide guidelines for technology integration support at the Local District and school levels also need to be determined. If the district is to realize a reasonable return on investment, adequate and coordinated professional development and technology support services need to be part of the planning and funding equation.

5.0   PLAN IMPLEMENTATION ISSUES

Learning is not about taking in information. It's about the enhancement of our capacity to take action.

— Peter Senge

5.1   Rationale

To ensure that technology has the desired impact on teaching and learning for all children, the district must develop processes for creating standards and policies and communicate those standards and policies to the schools consistently and completely. An operating assumption for all policies, activities, and planning efforts is that all students can and will be enabled to achieve at high levels. In order to accomplish this, the district needs not only continue to set common standards and expectations, but must ensure that classrooms are equipped with equitable resources and that teachers have access to effective training strategies to enable students to reach those standards and expectations.

Incorporating technology-based community learning programs into a school's repertoire of services and programs will better facilitate school and community linkages and improve communications with and support of the public.

5.2   Major Findings

There is much support at all levels for the establishment of technology standards for hardware, software and systems, but technology standards that take into account the specific educational requirements of users are as yet undefined. There has not been one organizational structure that effectively deals with technology standards. Accordingly, a variety of systems and applications have been acquired and adopted throughout LAUSD. There is no mechanism in place for encouraging compliance to standards that may exist or any effective means of enforcing the standards.

A district-wide Technology Steering Committee currently deals with technology-related policies and procedures. Clear criteria do not exist for what is core District policy and Local District level policy, and what is site-based policy in regard to instructional technology.

Regularly budgeted instructional technology acquisition plans or schedules at the district or Local District levels have not been established. There is dependence upon bonds, grants, and other extraordinary sources for technology funding.

Schools negotiate their own agreements with vendors for instructional software. Principals are sometimes in the position of making key decisions in regard to technology acquisition without appropriate and timely resources to guide their decision making.

There is no effective centralized maintenance system for support for school-based instructional technologies. For ITD customer support, there are no service level goals or standard of service, and staffing is inadequate for meeting demand at the school level. Equipment cannot be installed or repaired, nor are system software problems resolved in a timely fashion because staffing for maintenance and set up is very limited. Some schools have developed certified student repair services. However, these are isolated pockets of service that do not provide a solution to LAUSD's service crisis.

No central planning services are available to help schools, Local Districts, and special programs to conduct strategic planning. A Grants Assistance Office exists within LAUSD. However, this office does not generally prepare grants. They disseminate information and coordinate some required activities.

Strategic school improvement plans are submitted annually and have been reviewed at the cluster level. Not all schools have a technology component in their plan. Some schools that have planned for technology have not linked technology resources to high priority instructional goals. Criteria and processes for evaluating school-level plans are not uniformly established nor implemented district-wide. Some Local Districts have developed comprehensive strategic technology plans to help guide the planning of schools and complexes while others have not.

Instructional technology resources are typically not made available to community members beyond the school day. Appropriate instructional applications are neither identified nor available, equipment is not typically centralized, and resources for security and supervision are not available. District leadership has indicated a strong need for improved family outreach to support early intervention programs.

5.3   Major Initiatives

Technology Standards

- Establish a standard-setting committee of representative stakeholders and adopt a process for setting and reviewing standards for all major technology components, including networks, peripherals, and system software.

Equity

• Empower the Technology Steering Committee or a subcommittee of representative stakeholders to establish a process for reviewing and setting technology-related policies and procedures for the district.

Policies

• Develop policies and procedures at the school level for increasing student access to computers in libraries, labs and classrooms throughout the school day and after school hours.

• In collaboration with the Instructional Technology Branch, Local District and school leadership, and ITD should provide, for district-wide review, a set of criteria that determine which technology policies and decisions will be made at the District level, and which policies and decisions are Local District- and/or site-based.

• Develop clear policies and procedural guidelines regarding installation of new instructional technology equipment, upgrading and maintenance of older equipment, and phasing out of obsolete equipment.

• Develop policies, guidelines, and standards for acceptance of donated equipment.

• Review, upgrade, and communicate effectively, by various means to all schools and staff, the ethical and appropriate technology use policy.

Procurement

• Based upon the *Information Technology Plan* recommendations and an approved district *Instructional Technology Plan*, schedule and budget for technology acquisition and support on a regular, annual basis.

• Make informational and evaluative resources available online to all schools for aligning instructional software to priority student learning standards.

• Develop a rules-based procurement system that will ensure that schools follow established standards on technology purchases.

• Establish effective communications strategies for informing and updating schools, Local Districts, and programs about the status of district-wide site licenses for instructional software.

• Define minimum software standards for tool-based applications for students on each hardware platform and include as a minimum configuration for instructional workstations.

• Research and report to leadership at all levels the total cost of operation for educational technologies as applicable to educational settings.

Maintenance

• Research models for large districts on providing support for school/Local District end-user technologies.

• Replicate currently effective student-supported repair service models to other complexes and Local Districts.

• Over time, establish a fixed asset management program as part of the district-wide decision system that:

– stages/phases procurements

- tracks performance

- provides preventive maintenance accountability

- uses inventory information for decision support

District Planning

- Establish responsibility and organization structure for a permanent central planning function to develop, coordinate, implement, and monitor major district-wide planning efforts.

- Expand the capacity and functionality of the Grants Assistance Office to provide more guidance and technical assistance in the preparation of grants at the school, Local District, and district levels and to help staff focus grant efforts on high-leverage opportunities aligned to district priorities.

School-level Planning

- Establish a district-wide model for school-based planning that includes technology integration in support of district priorities and mandates.

Local District- and Program-level Planning

- Develop planning standards, models, templates, and resources to guide Local District and program level educational improvement and technology planning efforts.

Community Learning

- Seek ways to increase the number of technology-based community learning programs and mutually-beneficial technology-focused formal relationships, allowing both the school population and the community-at-large to benefit from, and contribute to, available technology resources.

- Expand existing technology partnerships and promote new technology partnerships with higher education, business, and industry.

- Enable sharing of data and information within and among school sites, health and service organizations, courts, and city and state agencies as part of a comprehensive student database within the proposed decision support system.

5.4   Implementation Approaches

Technology Standards

An integrated, Technology Standards Committee needs to be established to adopt a process for setting and reviewing standards for all major technology components. The technology standards development process should:

- Include activities that communicate to all stakeholders the need and benefits for standardization within parameters

- Allow for participation through representation by all user groups as well as involve vendor representatives and members of the Purchasing Branch

- Address periodic revisions that are necessitated because of technology market advances

Standards should be defined for network and workstation hardware (PC and Macintosh), software, and upgrades that address both technical capability and minimum capacity of equipment at classroom and building levels to help ensure equity of access across schools and to facilitate training and support. A policy should be defined that allows waivers to standards in certain situations that warrant variation, such as specific teaching situations, ongoing successful practices, or support of new technology pilots. It is important that the function of oversight of technology standards be assigned to a specific person or role within the organization that would be responsible for convening and facilitating the Technology Standards Committee.

Standards for instructional technology should align with teaching/learning environments at various grade levels and in various disciplines, and, accordingly, with teaching and curriculum strategies used in addressing learning goals for students

Real-time updates to all standards should be maintained and available online through the LAUSDnet web-site. The web site must be organized so that standards are easily referenced by all users. Instructional standards could be separated from administrative standards, as needed. Comments may be logged regarding the site, any standard, and its applicability to specific situations. The comments would be utilized to continually improve the site and be considered as input for upgrading of standards. On-site access to resources to guide purchases would support adherence to the standards.

Equity

Plans and standards for facilities must be designed so that classrooms will be modified over time to achieve a research-based, district standard (critical mass) for the ratio of computers to students district-wide.

To ensure a systems approach to reaching critical mass across the district, a school-level rubric could be developed for assessing inter-related elements of technology integration: hardware; software; network capacity and facilities; technology support staffing; degree of curriculum integration; impact of technology integration; and related staff development. A sample School-based Assessment Rubric is offered in Appendix D. Schools could self-assess their status regarding technology critical mass and access through use of the rubric and communicate results to Local District and district levels.

Policies

It is critical that the organizational body that deals with technology related policies and procedures has, as the foundation of its decisions, the District's core mission - the instruction of students. Technology policies and procedures should be continually updated and effectively communicated to all staff.

With regard to instructional technology, there should be clear criteria for determining what is core District policy, Local District-level policy, and what policies are site-based. The district needs to establish and clearly define the collaborative process for developing and implementing technology policies and decision-making parameters to meet emerging needs. It is recommended that the Information Technology Division collaborate with the Instructional Technology Branch, as well as Local District and school leadership to develop consensus and adopt criteria for making technology policy decisions. Policies that already have been established need to be communicated and reinforced. Online procedures should be made available that alert decision-makers to new and amended policies. It should be realized that standards and policies are not effective without a system-wide monitoring process to ensure compliance.

To maximize student access to technology resources, multiple strategies for monitoring, supervising, and securing computer use must be considered at the Local District and school levels. Funding needs to be provided at the district level for increased opportunities for student access throughout the school day and beyond. A number of schools already have expanded access to technology for their students. Strategies for sharing and communicating current best practices for expansion of student access to technology resources need to be initiated.

The policies regarding ethical and appropriate use of technologies must be reviewed and upgraded periodically to include incorporation of policies into curricular activities and projects. Ethical use policies must be effectively communicated and affirmed district-wide. Procedures for monitoring district-wide compliance to ethical and appropriate use policies need to be established.

A collaborative working group of Instructional Technology Branch and ITD staff should be organized to develop policies and guidelines for installation, upgrading, and maintenance of instructional technology equipment. This could be another function of the Technology Standards Committee. Policies and guidelines determined by the group may be placed on a web-site accessible to all school and Local District staff.

Obsolescence for instructional computers and peripherals should be defined. The Instructional Technology Branch should make efforts to identify and communicate potential effective uses of older equipment to schools. LAUSD should develop "use or move" procedures by which older equipment is relocated to interested schools/classrooms for the identified purposes, or else discarded. Schools will need to gather and dispose of unusable equipment in an environmentally safe manner.

There is a need for communicating policies and/or guidelines regarding acceptance of donated equipment to all schools and Local Districts. All schools and Local Districts must be required to adhere to the policy or guidelines for donated equipment. The Technology Standards Committee should identify LAUSD standards for acceptable computer and peripheral donations to schools and develop an appropriate communication for potential donors. Guidelines should clearly define the minimum standard for acceptance of donated computers, the required components that must accompany the donated computers, and the need to adhere to licensing restrictions on operating systems and included software. The donation standards will need to be upgraded periodically. Communications regarding donations standards should be proactively issued to all businesses, agencies, and institutions in the region who could be potential donors.

Procurement

LAUSD's current budgeting processes have not accommodated regular technology purchases or upgrades based upon life cycle strategies. Reliance for technology improvements has been on periodic, extraordinary financing approaches such as special ballot propositions, bonds, and grants. The district should strive to schedule and budget for technology acquisition and support on a regular basis. This would help the schools deal with technology support and obsolescence in a planned, predictable manner. Multiyear technology budgets should be developed and supported for each school based upon:

- Standards for desktop hardware and software

- Critical mass decisions regarding recommended configurations for various learning environments

- The goal of achieving equity over time without restricting the capacity of progressive schools/programs to provide leadership in effective practices.

The district should ensure alignment among the district *Information Technology Plan*, the *Instructional Technology Plan*, and Local District and school level plans through clearly established linkages in the plan development and upgrade processes.

To promote adherence to technology standards, each school needs an experienced staff member or someone assigned to them who is knowledgeable about technology. A rules-based procurement system should be developed, possibly as a component of the decision support system being designed, which will help with compliance to standards. ITAFs could work with schools within Local Districts to identify appropriate resource staff and informational resources to assist in acquisition. ITAFs might also work with responsible district-wide staff and LAUSDnet staff in communicating processes regarding adherence of technology purchases to established standards and for meeting specific educational requirements.

Instructional Technology Branch personnel may be identified who are responsible for negotiating and monitoring the status of district-wide instructional software licenses. A web site could be developed for license status updates as well e-mail notification system for ITAFs to help guide purchasing within Local Districts.

Standards for software applications need to be established with consideration of the present installed base as well as future requirements. The district needs a vehicle for negotiating blanket contracts for software and supplies that allows schools to order directly from approved vendor lists and catalogs at favorable discounts. Standards for applications should be phased in with acquisition of new equipment and should be communicated to all personnel involved with the design and delivery of staff development programs. In redesigning the procurement system, input from users at the school, Local District, and departmental/program levels needs to be considered. Any new or upgraded procurement procedures should incorporate the support and training required for successful implementation. Schools and Local Districts might benefit from research on total cost of operation of technologies to assist in long term planning for technology.

The district should institute a comprehensive online database inventory of all technology (including computer peripherals) located in the schools. Such a database will help the district track purchases and determine the age of items, so it can re-deploy technologies and more equitably allocate scarce resources for technology.

Maintenance

Instructional technology follows a life cycle that begins with the development of technical standards, moves through procurement of the technology, and ends with maintenance of that technology throughout its useful life and retirement (see Figure 8). To create the best educational outcomes and generate the highest level of return on investment, each of these steps must be addressed in a coherent manner.
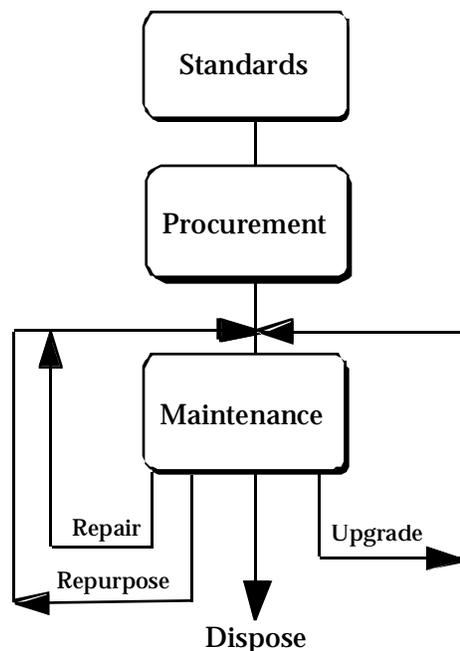
Figure 8: Technology Life Cycle

The school district's customer support system for technology is inadequate due to severe under-staffing. The Information Technology Division's repair service, focused largely on system-wide network repairs and administrative system maintenance is perceived as being useful within its operational restrictions; but, demand swamps supply. The district must therefore support an immediate review and revision of its organizational structure for supporting instructional technology to meet the challenges of increased availability and use of technology resources.

The organizational design for technology support must consider required functions, competencies, and staff to meet the demands of customers and to ensure the realization of an ongoing quality improvement process. A process for service delivery and communication should be devised while examining a service model that decentralizes, at least to some extent, specific customer support functions to the school level. Service-level goals for maintenance should be established once the organizational structure exists for implementing them. Contemporary research indicates that for effective support of users with common desktop applications, a ratio of 1:100 support staff to users is recommended. LAUSD currently has human resources far below this guideline.

LAUSD may consider issuance of an RFP to solicit approaches for determining the most cost effective and appropriate options for maintenance and support functions for instructional technology. If the decision is made to provide instructional technology maintenance functions internally, an organization chart and plan for providing support for instructional technology at the district, Local District, and school levels need to be developed. An engineering plan and charter for the new help desk and customer support organization to include staffing and organization, professional training, service delivery and communications, and ongoing quality improvement processes should follow. It is critical to align customer support services with standards, policies, guidelines, and recommendations about hardware, software, networks, etc. used to achieve the goals of the *Instructional Technology Plan.*

A system for inventory, accountability, and tracking of repair records of instructional technology equipment would contribute to the effective deployment and upkeep of current and future resources. The district should establish a highly coordinated, fixed asset management to help avoid problems throughout the asset life cycle such as procuring more technology than can be utilizes at the beginning of the life cycle, and unplanned-for obsolescence at the end of the life cycle. It should be ensured that the fixed asset management program interfaces effectively with procurement components of the decision support system.

Until the major decision is made regarding outsourcing vs. internal organizational development, schools and Local Districts need to be provided with maintenance and support options and model service contracts. A database system may be designed and distributed for monitoring and supervising repairs in order to flag computers that are repaired multiple times or are over a certain age, etc. Even knowing which equipment is under current warrantee can often be useful in cutting repair costs at the school and Local District levels.

District Planning

Those organizational units within LAUSD that engage in strategic planning do so with a resulting strain upon their human resources and with little coordination, if any, with other units. If major planning functions were centralized, all units could focus on a unified set of strategic goals, have their efforts aligned with that of other units, and may actually find that planning provides time efficiency for the members of the unit. Establishment of a permanent central planning office is necessary to guide effectively the many initiatives that contribute to improved learning and effective management in LAUSD. Functions that would be served by a central planning office should not be determined in isolation, but through a process that reconsiders the functions associated with all central office leadership positions and their interactivity.

Consideration, therefore, should be given for the establishment of a strategic framework and charter for a central planning office within LAUSD and/or within Schools, Curriculum, and Instruction. A first step would be to determine critical priorities for district-level planning. It is imperative that district-level planning emphasizes the connections and interdependencies among all initiatives and their support of district-wide goals. The major critical needs for district-level planning should be identified and prioritized. District planners should provide models, guidelines, and oversight for Local District, school, and program planning. These models and guidelines should be research-based and adapted to meet the specific needs of LAUSD. District planning should result in action steps with specified activities, responsibilities, and timelines that clearly support strategic goals and high priority mandates. Implementation monitoring and evaluation systems must be established to ensure quality, coordination, and accountability at all levels.

Just as planning for technology could benefit from district-wide coordination, efforts at seeking funding for established plans also need coordination. The Grants Assistance Office provides some level of coordination, but is not staffed to provide extensive technical assistance throughout the district. Some steps could be taken to expand the capacity and functionality of the Grants Assistance Office to offer more guidance at the school, Local District, and district levels. Some approaches include:

- Establish criteria for determining high-leverage grant opportunities.
- Maintain and publicize the Grants Assistance web site.
- Explore expansion of Grants Assistance personnel through a fee-for -services arrangement funded by the district.

School-Level Planning

Some clusters provided effective models and templates for school improvement and technology planning. Existing school improvement planning models, templates, and resource materials must be reviewed carefully and upgraded to ensure alignment with district standards in curriculum, crosscutting competencies, professional development, and technology and yet continue to offer sufficient flexibility to meet site-based needs. Upgraded models should be multi-year with the most detail offered in a first-year action plan. As LAUSD moves into a new configuration consisting of Local Districts, the model should incorporate critical success factors to include:

- Stakeholder input
- Linkage to district strategic goals and high priority mandates
- Targeted professional development
- Sound budgeting
- Monitoring and evaluation strategies

School-level plans should be developed and submitted electronically for ease in communicating and upgrading. Electronic format also enables compilation of information at the Local District and district levels. Key school-level planners should be given the necessary technology tools and training to automate the planning process effectively. Local districts need to establish evaluation criteria that reflect district standards for school-level plans; and, to identify and assign responsibility for providing evaluative feedback and remediation support for school planning efforts. Plans should be submitted to designated Local District leadership for review and evaluation with expectations for timely feedback for remediation or approval.

Models for recommended configurations for classrooms, libraries, computer labs, and other technology-supported resource areas should be offered to schools to assist with planning. Recommended informational features might include HVAC, electrical power access, lighting, space, network access, phone lines, security, and other factors that affect decision making regarding technology system maintenance and installation.

Local District and Program Level Planning

Local district- and program-level technology planning models and processes should be developed that incorporate similar critical success factors as outlined for school-based plans. Program planning could include areas such as Title I, special education, School-to-Career, and adult education. Such models should be developed, standardized, and provided to Local District leadership to ensure alignment with established standards and strategic priorities of the district, and yet allow sufficient flexibility to meet Local District and programmatic needs.

Local district and program leadership should be provided with planning models, training, web-based templates, and materials to be used in the development of strategic improvement plans that address priorities relative to: student achievement, curriculum, staff development, and technology integration. Strategies must be developed for full utilization of technology tools to address and eliminate any identified obstacles. Alignment of Local District and program goals with district priorities is critical. Accountability may be ensured by developing Local District and program planning models that incorporate strategies for monitoring and evaluation of plan implementation.

As recommended for school improvement planning, technology plans of Local Districts and programs should be multi-year with most detail offered in a first-year action plan. These should be developed and submitted electronically for ease in communication, sharing, and upgrading. Local district and program technology plans should be reviewed and the district level with timely feedback provided for remediation or approval.

Community Learning

In addition to forging strong links between school and home, technology-based community learning programs offer an efficient way to create lasting partnerships among schools, parents, families, and other segments of the community. The outcomes of sharing with the community a school's educational, business and technology resources should prove to be an enormous benefit to all involved. Access to schools' technology resources in the form of community learning programs will increase technology literacy within the greater community as well as provide greater cost effectiveness of schools' technology expenditures. A committee of school and parent representatives from schools with model technology community learning programs could support other schools in developing a parent volunteer program. Parents who have technology skills as well as those who are willing to be trained can be recruited to volunteer in computer labs, libraries or in classrooms, at which time they will also be able to upgrade their technology skills. However, as technology-based community learning programs are established at a school site, it is important to develop a set of guidelines for giving local residents and the community access to technology facilities after school and during times when school is not in session. A web-based catalog should be developed that describe in detail some exemplary national, regional, and local technology-based community learning programs. Guidelines and support are needed for assisting schools and Local Districts in establishing programs that foster and encourage access to technology resources for after school programs in schools and throughout the community for children and adult community members.

Actions to develop and expand community programs involving us of technology resources should include:

- Assessing the status of parent and community access needs as to hardware, software, and training.

- Increasing access to hardware, software, the Internet, and training to address and facilitate parent and community needs, partnerships, and linkages with city and state agencies.

- Identifying and addressing equipment, security, and technical issues associated with cross-agency sharing of data and information.

Local district-wide or city-wide information and planning sessions may be conducted, highlighting existing community learning programs, and how to successfully establish, fund, and market technology-based community learning programs.

Although technology levels within the district have benefited from a number of partnerships and alliances, there is limited coordination among community programs, partnerships and relationships among schools. In order to promote new technology partnerships LAUSD should consider planning and conducting a School Technology Partnership Summit that will focus educating school department personnel and community leadership on currently successful partnerships, expansion of existing relationships, and promoting new partnerships with higher education, business, and industry.

There is also the potential for technology-based community learning programs to develop and sustain community-wide support for technology while at the same time increasing parent, family, and community technology literacy, thus ensuring a climate of technology understanding and knowledge. As schools pursue joint school and community-based organization relationships, there will be opportunities for schools to be open during off-hours. This time could be used for jointly agreed upon programs for adult education classes and programs aimed at promoting the technological fluency of parents, including weekend programs, "off-track" programs, courses for credit, and enrichment programs.

Instructional Technology Plan
for the
Los Angeles Unified School District

Implementation Resources

1.0   MONITORING AND EVALUATION

A major benefit of planning is that it serves as a learning catalyst. As plans such as the *Instructional Technology Plan* are put into place, the district must learn to monitor, evaluate, and revise its plans for maximal effectiveness. Strategies for inclusion into this reflective process consist of ongoing data collection regarding selected performance measures, timely communication of data and analyses to key decision makers, and periodic reports that address both implementation and impact assessment.

The interim document, *Key Findings, Recommendations, and Implementation Approaches* recommends that a formal system for monitoring and evaluation of the comprehensive *Information Technology Plan* be developed and implemented. This section presents detailed strategies and examples for accomplishing that task.

1.1   Performance Measures and Tracking Strategies

Two general categories of performance measures are needed for:

- Monitoring the implementation of the plan
- Evaluating the technology initiatives aligned with selected outcome measures

Performance measures, or indicators, are typically categorized as one of five types:

- *Impact*—measures of outcomes that include student learning, equity of access to technology, and quality of technology-rich student learning opportunities provided by teachers
- *Output*—measures of products and services provided, such as the number of teachers trained, number of curriculum guides with technology skills embedded, and number of classrooms connected to school and district telecommunication networks
- *Input*—measures of resource allocation and use that encompass the ratio of students to computers, resources allocated to education, training, support activities, and allocation of technology resources across schools
- *Productivity*—measures of work performance, such as time to install school networks, hours of training required to produce teachers competent in using technology in their classrooms, and average time to respond to requests for technical assistance
- *Demand*—measures of potential markets that include the number of requests for pedagogical and technical assistance, number of teachers needing specific types of training, and number of classrooms with obsolete equipment

Each of these five indicators can be used to describe conditions or performances at the district, Local District, and school levels. Depending upon the level, one division's input can be another division's output or impact. For example, the number and percent of teachers using help desk support may be a *demand* indicator for the Instructional Technology Branch and an *impact* indicator for the Information Technology Division or those responsible for providing education, training, and support services. Like Einstein's perspective on time, what one sees is a function of where one stands in the overall system. Table 1 provides examples of the five indicators as applied to two broad categories: teaching and learning support and management support.

Indicator	Teaching and Learning Support	Management Support
Impact	• quantity and quality of student writing • percent of teachers using technology applications in their day-to-day teaching	• accuracy of attendance data • accuracy of budget projections • scope and quality of information regarding school facilities
Output	• number of workshops provided to teachers, administrators, and staff • number and/or percent of teachers, administrators, and staff trained • percent of time network is in service	• number of buses required to transport students • number of automated databases developed in support of tracking staff technology competencies
Input	• number and/or percent of classrooms networked • student/computer ratio	• number and/or percent of schools with automated library systems • number and/or percent of schools with automated attendance systems
Productivity	• number of training hours needed to achieve a specific teacher competency, such as use of the Internet • time devoted to taking and reporting attendance	• time required to schedule high school • time required to prepare state reports
Demand	• number of teachers and administrators requesting training and support • number of parents requesting training and support	• number of staff requesting training and support • number of unfulfilled requests for automated databases

Table 1: Examples of Indicators

Implementation Monitoring

Implementation monitoring typically addresses the following questions:

- Were tasks completed as designed? Were implementation timelines met? If not, why?

- What barriers were encountered during implementation? How were they addressed?

- What changes were implemented? Why? To what effect?

- What are the implications of these mid-course corrections for redesign?

Implementation monitoring usually is attached to objectives with input and output indicators. Table 2 presents an example of these objectives and identifies selected indicators for monitoring implementation.

Initiatives	Objectives	Indicators
Learning Outcomes and Teaching Strategies	Provide teachers with electronic access to instructional models and materials for addressing student technology competencies in subject areas.	• formal publication of student technology competencies by grade • number of curriculum guides incorporating technology competencies Web site with database of model instructional units and lessons
Training and Support	Provide in-class modeling and coaching for teachers in the use of appropriate technology applications.	• number and/or percent of teachers served with in-class modeling and coaching by school

**Table 2: Example of Indicators for Monitoring the Implementation
of Selected Technology Initiatives**

Table 3 provides an example of a chart for developing data collection instruments and procedures that address each indicator. Typically, a specific organizational unit or individual will be assigned responsibility for accomplishing an objective as well as for collecting and reporting data on the related indicators.

The district should maintain all monitoring information in a database. Such a database can document, capture, and make information widely accessible on the myriad of small, immediate adjustments occurring during implementation. The Instructional Technology Branch should investigate the use of groupware to provide up-to-date information on the status of each indicator.

Two group ware products illustrate the electronic capabilities that might be employed. Lotus Notes™, for example, provides powerful capabilities for collecting, organizing, and disseminating data and information in diverse forms. The strategic management system developed by Kaplan and Norton (*The Balanced Scorecard*, **1996**) provides a user-friendly interface to powerful database capabilities. The system allows managers to track specific performance indicators in easy-to-use formats that can be disseminated through the district Intranet. Software such as this makes it easy for decision-makers to track important data and to communicate that data effectively to a variety of stakeholders. The software also allows the district to employ continuous feedback systems to monitor time lines, key events, and measures of cost and productivity.

Objective	Indicator	Data Collection Instruments and Procedures	Person or Unit Responsible
Provide teachers with electronic access to models for addressing technology competencies in subject areas.	• formal publication of student technology competencies • number of Web site contacts	Check for document availability to all teachers and administrators. Survey random sample of teachers.	Instructional Technology Branch
Develop instruments and procedures for assessing student technology competencies.	• Web site with database of models	Review Web site. Conduct survey to determine awareness.	Instructional Technology Branch
Provide in-class modeling and coaching for teachers in the use of appropriate technology applications.	• number and/or percent of teachers served	Maintain a log of coaching sessions.	School technology coordinators and/or Local District ITAFs

Table 3: Objectives and Indicators for Collecting Data to Monitor the Implementation of the Technology Plan

Impact Assessment
This section describes a structure and process for assessing the impact of technology initiatives on specific improvement initiatives and performance goals related to the *LAUSD District Curriculum Guide* and *California State Learning Standards*. All five indicators described in Table 1 might be addressed, but particular attention should be given to impact, productivity, and demand indicators.

Learning Support

Perhaps the best synthesis of research linking the knowledge base on learning to that on high technology performance is that done by Beau Fly Jones (*Plugging In: Choosing and Using Technology,* North Central Regional Laboratory). Jones and a team of lab researchers examined research on engaged learning and high technology performance. They identified key indicators for engaged learning and for high technology performance and proposed a process for using those indicators to assess the effectiveness of individual technologies and technology-enhanced programs in support of the engaged learner.

Jones and her partners identify six categories of indicators for identifying high technology performance in support of engaged learning:

- *Access* to diverse technologies that a school provides students

- *Operability* of the technology

- *Organization* of the technology in terms of location and distribution

- *Engagability* ,or the capacity to engage students in challenging learning

- *Ease of use*

- *Functionality*, or the technology's capacity to prepare students to use a variety of tools.

These indicators could be employed by LAUSD to assess the quality of technology applications used in classrooms.

The National Study of School Evaluation has also developed *Indicators of Quality Information Technology in K-12 Schools* (1996). The indicators are organized into three areas:

- Goals and performance indicators

- Indicators of the capacity of the school's instructional system

- Indicators of the capacity of the school's organizational system

These indicators are useful for designing technology-rich learning opportunities and environments and in guiding the identification of indicators for assessing the Instructional Technology Branch's contribution to specific objectives in the *LAUSD Curriculum Guides* and *California State Learning Standards.*

Assessment Design Process

The purpose of the assessment system is to provide ongoing information on implementation and impact. Assessment processes should be linked to the detailed implementation plan.

The assessment design process should include these process steps:

- Set priorities among implementation strategies

- Transform priority strategies into results-oriented objectives

- Select performance measures for each objective, use research to identify measures

- Assign responsibility for each objective to the appropriate LAUSD level/unit

- Establish a database for tracking performance measures
- Develop analysis and reporting procedures and formats
- Identify key decision makers requiring specific indicator data

The assessment process needs to attend to data available from outside the system. Such information as new technical capabilities, new best practice information, and new federal, state, and district regulations and requirements are important to capture.

The assessment process needs to be simultaneously top-down and bottom-up, gathering information from the operating system about what is happening in schools with respect to the objectives, what new or enhanced interventions are needed to obtain the results, and what new or unanticipated outcomes and results are being realized.

1.2   Communication Processes

Typically the challenge is how to disseminate data to all those who need to know. A different approach is proposed that redefines the task as one of accountability rather than dissemination, as described below:

- Assign data collection on indicators to those units accountable for accomplishing the objectives related to those indicators. Embed the data in an accountability context. When specific staff members are accountable for certain outcomes, they will have a built-in self-interest in the scope and quality of the data they require. If this alignment of need and use is not established, communication is defined as a problem of dissemination—convincing various people to access data they are not convinced they need.
- Establish standards for assuring quality data collection and analysis.
- Make information available to all using the emerging telecommunications infrastructure.
- Use software tools to alert automatically those who need to know about specific data.
- Assign oversight of the data collection process to the district planning office that should be responsible for serving the data requirements of all decision-makers.

1.3   Future Technology Plan Design

While the Instructional Technology Branch will need to continue to oversee implementation planning, it should integrate strategic technology planning into LAUSD's ongoing planning for addressing the district *Curriculum Guides* and *California State Learning Standards*. All technology planning should be focused on what technology applications are required to advance the district's annual performance goals in support of the instructional programs based on the learning standards.

Until a comprehensive process for program monitoring and evaluation can be developed and activated, the district should develop and utilize a school-based Rubric Assessment Instrument (see sample in Appendix D) to monitor progress against identified variables and indicators.

A combination of these tools should be reviewed by the ITAFs or Instructional Technology Branch staff to determine their value as components of a tracking mechanism for monitoring implementation of specific elements of the blueprint.

2.0   BUDGET

2.1   Introduction

A budget for funding aspects of the *Instructional Technology Plan* can be developed based upon a set of assumptions for software, hardware, and maintenance services. Major assumptions that should be used in developing this budget are outlined below. It should be noted that, at the time of this writing, LAUSD has applied for federal E-rate discounts to be applied to the building of wide-area, and local area networks. These discounts will have a major impact on the any technology plan budget.

In determining an accurate overall cost of the instructional technology program, the following process needs to be followed:

- Accurately identify the population to be served
- Establish technology target levels
- Identify accurate standards and cost per unit for equipment that meets standards
- Determine total needed
- Deduct existing resources meeting standards
- Calculate unmet need
- Determine phase-in by year
- Identify funding sources

Once the necessary costs are determined, the district should establish an on-going, annual commitment, as a "line-item" in the regular budget to support the technology infrastructure in classrooms.

2.2   Assumptions and Considerations

Demographics

- The district serves approximately 710,000 K-12 students.
- There are approximately 32,700 teachers in LAUSD.
- Six to one student to computer contemporary workstation ratios at all levels.
- One contemporary portable workstation for each teacher, not to be included in the six-to-one ratio for students.
- Adequate shared peripherals (printers, scanners, etc.).

Software/Media

- $200 per student workstation should be allocated, initially, for instructional software plus $125 for upgrades over the five-year period.
- It is estimated that it will cost $150 per workstation for office productivity and communications software. These are based on average costs, and assume the use of site licenses, volume discounts, and academic pricing where possible.

Hardware

- New teacher/professional workstations will require a 10/100 Ethernet connector, 56 kbps dialup modem, and DVD-ROM with video-in and video-out capabilities.

- New student workstations will require a 10/100 Ethernet connector, DVD - ROM, and a 15" monitor.

- Support staff workstations will have a 10/100 Ethernet connector, DVD -ROM, and a 17" monitor.

- All workstation costs will include standard three-year warranties.

- The district currently has approximately 35,000 student computers that meet the established standards.

- No inflation or deflation should be assumed for hardware. By maintaining the same price point for hardware, increasingly powerful systems will be purchased in future years for the same price.

- Estimated the cost of peripherals at 10% of student workstation costs to account for sharing and warranties.

Network Infrastructure

- Costs for network infrastructure should take into consideration standards outlined in the General District E-Rate proposal.

Services

- All equipment will be purchased with a three- year's warranty.

- Maintenance on hardware will be at 10% of the purchase price per year starting when the warranty expires.

- Maintenance funds can be used to staff internal maintenance services, external maintenance contracts, or a combination thereof.

- Professional development should be funded at a rate of 25% of all student and teacher workstation hardware and software purchases.

- The school district will self-insure equipment purchased.

Staffing

- Costs for additional technology support staffing should be budgeted as mission critical, that is, the same as electrical and plumbing services.

3.0   ACTION PLAN

The Action Plan that follows provides specific steps for implementation for the many key initiatives that were developed in the Blueprint of this *Instructional Technology Plan*. Staging and phasing of implementation of steps is displayed over four phases. Each of the four phases corresponds to approximately one year of implementation activity. Special sources of funding (i.e., E-rate) can accelerate implementation just as budgetary restraints may impede the implementation schedule. Bars in the staging/phasing matrix indicate the phase (year) in which each activity is planned to begin and end. Some activities will be ongoing through several phases (years); hence, the bars for those activities will span several blocks in the matrix. Also for each major initiative, there is an indication as to the responsibility level for its implementation. The Action Plan will be useful to LAUSD in determining an annual work plan for implementation activities and for anticipating the resources and budgetary support needed from year to year.

	Phase I (7/1/99 to 6/30/00)	Phase II FY 2001	Phase III FY 2002	Phase IV FY 2003 and beyond	Responsibility Level
CURRICULUM AND LEARNING STANDARDS					
Curriculum /Technology Integration					
Identify and adopt strategies for systematically integrating technology into all aspects of the curriculum.					
• Identify, embrace, and disseminate a set of research-based curriculum/technology integration approaches that align student technology standards with content standards and process skills.	▬▬▬▬				IN, ITAF, LD
• Create and regularly update guidelines to assist teachers in the selection of hardware and software resources that are differentiated by instructional levels and content area.			▬▬▬▬		IN
• Design a web site to distribute the technology selection guidelines to teachers.			▬▬▬▬		IN
• Link selection guidelines to staff development design and implementation.			▬▬▬▬		IN
Include, as part of LAUSDnet and ultimately as a component of the district's decision support system, an easily accessible, relational database of lesson plans and/or units for sharing successful integration practices across the district.	▬▬				
• Develop criteria for selecting lesson plans/units.	▬▬				IN
• Design unit template with searchable fields.	▬▬				IN
• Determine quality control procedures for unit approval.					IN

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	Phase I (7/1/99 to 6/30/00)	Phase II FY 2001	Phase III FY 2002	Phase IV FY 2003 and beyond	Responsibility Level
• Design and conduct a variety of staff development initiatives for using (inputting units into and searching) the database.	————	————	————	————	IN
CURRICULUM AND LEARNING STANDARDS					
Curriculum /Technology Integration (continued)					
• Make this database available through the LAUSD web site.		————	————		IN
• Utilizing KLCS, broadcast exemplars of successful integration practices and provide information on useful instructional resources.		————	————	————	IN
• Investigate and document successful practices of other large school districts with similar populations as LAUSD.	————	————			IN
Research and disseminate via the LAUSD web site successful strategies, programs, and models for addressing the needs of students at-risk from pre-K through grade 12.					
• Define and identify the district's at-risk populations.	——				T
• Determine criteria for selecting at-risk populations that can benefit from technology enhanced interventions.		————			T
• Align technology enhanced interventions with at-risk populations.		————	————		IN, T
• Create and disseminate assessment strategies to align individual students at-risk with the most appropriate intervention.			————		IN

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	Phase I (7/1/99 to 6/30/00)	Phase II FY 2001	Phase III FY 2002	Phase IV FY 2003 and beyond	Responsibility Level
• Promote partnerships with childcare service providers offering before-school, after-school, and weekend programming for LAUSD students.			————		LD, S, IN, IT
CURRICULUM AND LEARNING STANDARDS					
Curriculum /Technology Integration (continued)					
Research and document successful uses of alternative desktop computing devices supporting curricular goals, improving literacy, increasing student performance on district standardized tests, and addressing the district's priority areas.					
• Research, develop, and disseminate a guide for creating effective technology enhanced learning environments that includes the use of alternative desktop computing devices, such as portable writing keyboards, graphing calculators, laptop and portable computers.	————				IN
Develop and implement a district-wide online system that aligns educational materials with state learning standards and with LAUSD's goals and major educational priorities.					
• Research and identify existing systems with the capacity to meet LAUSD needs.		————			IN
• Identify customization required for LAUSD Local		————			IN, LD, S, T
• Review the system from a technical perspective to ensure that it can be integrated into the district's decision support system.	————————				IN, IT, T
• Determine implementation strategies, timelines, and maintenance needs.	————————				IN, IT, T

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	Phase I (7/1/99 to 6/30/00)	Phase II FY 2001	Phase III FY 2002	Phase IV FY 2003 and beyond	Responsibility Level
CURRICULUM AND LEARNING STANDARDS					
Curriculum /Technology Integration (continued)					
• Negotiate high volume purchasing agreements for all LAUSD schools with vendors of core instructional applications. Distribute procedures for securing instructional materials at these prices to all schools.		————	————	————	IN
Student Technology Standards					
Select and endorse a comprehensive set of student technology standards, K-12, with associated student assessment strategies and/or performance measures.					
• Identify/endorse major categories of student technology standards based upon national models.	————				IN, ITAF
• Develop/embrace a list of K-12 student technology standards within each major category, differentiated by instructional levels.	————	————			IN, ITAF
• Develop a comprehensive set of assessment strategies to assist teachers in measuring student proficiency of specific technology milestones at selected instructional levels.			————	————	T
• Provide teachers and professional development personnel with models for systematically integrating technology standards within subject areas, themes, and/or lesson plans.			————	————	IN, ITAF
• Design and implement a web-based relational database to accommodate the K-12 student technology standards.			————	————	IN

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CURRICULUM AND LEARNING STANDARDS					
Student Technology Standards (continued)					
• Establish effective communication channels to achieve accountability in implementing the student technology standards graduation requirement.		———			IN, LD, S, ITAF
• Create a review/transition process for schools who have previously embraced other technology standards to ensure consistency across the district over time.		———			IN
Assessment					
As a component of the district's decision support system, integrate an automated, easy-to-use assessment system, composed of multiple indicators and linked to the district content standards, that provides teachers and administrators with information about student mastery of learning standards and cross-discipline competencies.					

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	Phase I (7/1/99 to 6/30/00)	Phase II FY 2001	Phase III FY 2002	Phase IV FY 2003 and beyond	Responsibility Level
CURRICULUM AND LEARNING STANDARDS					
Assessment (continued)					
• Implement a district-wide student assessment system that: - addresses multiple indicators (i.e., the SAT-9, on-demand performance assessment, and authentic classroom-embedded assessment measures) - correlates all forms of student assessment with the content standards, benchmarks, and performance standards - links directly to curriculum development and learning management information - provides electronic, easy-to-access information to teachers - creates assessments that determine student proficiency with technology in the context of the integrated curriculum - provides access to banks of assessment tasks - includes ability to aggregate and disaggregate assessment data by multiple student characteristics - provides online assessments that are timely and easily implemented in critical developmental areas and levels.					CA, IT

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	Phase I (7/1/99 to 6/30/00)	Phase II FY 2001	Phase III FY 2002	Phase IV FY 2003 and beyond	Responsibility Level
Measure the impact of pilot projects and school-level initiatives in the area of assessment.					
• Develop instruments and procedures for evaluating the impact of the pilot projects.		————————————			CA, S
• Gather both quantitative and qualitative data about the programs.		————————————			CA, S
• Compile the data and report findings.		————————————			CA
CURRICULUM AND LEARNING STANDARDS					
Assessment (continued)					
• Create a set of guidelines for potential district-wide implementation based upon study results.		————————————			CA, IT
• Review assessment initiatives from a technical perspective to ensure that they can be integrated into the district's decision support system.		————————————			CA, IT
• Develop implementation guidelines and technical specifications for schools and Local Districts interested in embracing successful models for assessment.		————————————			CA, T, LD

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	Phase I (7/1/99 to 6/30/00)	Phase II FY 2001	Phase III FY 2002	Phase IV FY 2003 and beyond	Responsibility Level
CURRICULUM AND LEARNING STANDARDS					
Curriculum Development/Learning Management					
Expand the criteria and components of the current decision support system design to include a web-based curriculum development and learning management system using relational database architecture to link curricular, instructional resource, assessment, and student information.					
• Integrate into the proposed decision support system a curriculum development and learning management system that will: • Be easily accessible to teachers and administrators at all levels • Use a relational database architecture • Link curricular information with learning resources, student assessment, and student information • Monitor the alignment of instructional resources to district standards • Enable educators to record and share the alignment of content standards, benchmarks, performance standards, frameworks, and cross discipline competencies.	———				IN, IT, CA
• Develop functional and bid specifications for the curriculum development/learning management system in accordance with identified district needs.	———				IN, IT, CA

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	Phase I (7/1/99 to 6/30/00)	Phase II FY 2001	Phase III FY 2002	Phase IV FY 2003 and beyond	Responsibility Level
• Procure, implement, and test the curriculum development/learning management system in a pilot setting.		——			IN, IT, S
CURRICULUM AND LEARNING STANDARDS					
Curriculum Development/Learning Management (continued)					
• Implement the curriculum development/learning management system across the district.			————————		IN, IT, S
Funding Approaches					
Focus on channeling federal, state, and local grants and entitlements into technology resources and initiatives that address the district's seven priority areas.					
• Develop and disseminate a menu of all federal, state, and local grants and entitlements for technology resources and initiatives that are available at the school, Local District, and district level.	————————————————				T
• Encourage school staff to tap all available funding sources in support of technology initiatives.	————————————————				LD, ITAF, S
• Identify strategies for finding and applying for "special audience" grants.					T
- identify individuals/agencies with the skills to develop competitive grant applications.		——			
- conduct workshops/seminars on successful grant development.					
- regularly check web sites for grant opportunities.					

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• Locate standard grant elements on the district web site for easy access during the grant development process including: - district's seven priority areas - technology mission, vision, and goal statements - strategic improvement plans - needs assessment data	————	————	————		T

	Phase I (7/1/99 to 6/30/00)	Phase II FY 2001	Phase III FY 2002	Phase IV FY 2003 and beyond	Responsibility Level
HUMAN RESOURCE MANAGEMENT AND DEVELOPMENT					
Staff Technology Competencies					
Identify technology competencies and levels of performance for teachers and other staff who support curriculum, instruction, and student learning.					
• Determine the technology competencies for each staff group and relate them to the primary functions of the different staff.	————				T
• Develop video-based training models that include exemplars of what staff competencies look like when applied.		————	————		T, IN

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	Phase I (7/1/99 to 6/30/00)	Phase II FY 2001	Phase III FY 2002	Phase IV FY 2003 and beyond	Responsibility Level
• Identify technology competencies and levels of performance for principals that address their leadership and supervisory functions, as well as, those related to administrative and management responsibilities.	—————	—————			T, S
• Develop technology competencies and levels of performance for Local District leadership.		—————	—————		T, LD
Identify and implement a district-level comprehensive professional development planning model to enable more effective coordination and collaboration among various branches and groups providing training.					
• Determine the scope of professional development services that will be provided at the district-, and school-levels.	—————	—————			PD, IN, T
HUMAN RESOURCE MANAGEMENT AND DEVELOPMENT					
Staff Technology Competencies (continued)					
Set and communicate district-wide expectations for Local District- and school-based technology training to develop technology competencies.					
• Identify successful models and practices for both Local District-provided, and school-based technology staff development, such as: collegial workshops, tutorials, peer modeling, coaching, mentoring the development of student technology leaders, and distance learning options.	—————	—————			PD, IN, T

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	Phase I (7/1/99 to 6/30/00)	Phase II FY 2001	Phase III FY 2002	Phase IV FY 2003 and beyond	Responsibility Level
• Develop and implement strategies for online sharing of successful Local District and school technology-related staff development models and practices within, and among, Local Districts.		————	————	————	PD, IN, T, IT
• Set the expectation that descriptions for technology-related staff development activities will identify the targeted technology competency and performance level.	————				PD, IN, IT
• Ensure that program descriptions clearly communicate and prerequisite competencies and experiences and the minimum hardware and software requirements to ensure that participants will be able to use their new learning upon return to their school/work sites.		————	————	————	PD, IN, IT
• Include, as part of the basic curriculum in the classroom management module for beginning teachers, how to use and manage classroom technology resources.		————	————	————	
HUMAN RESOURCE MANAGEMENT AND DEVELOPMENT					
Staff Technology Competencies (continued)					
• Develop technology vision and technology competencies in new school leaders as part of the New Administrators' Academies.	————	————			IN, PD
Develop and implement technology-supported delivery systems.					
• Research currently available online courses and development resources and provide Local District and school personnel with printed and /online information on sources.	————	————			T, ITAF, LD, S

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	Phase I (7/1/99 to 6/30/00)	Phase II FY 2001	Phase III FY 2002	Phase IV FY 2003 and beyond	Responsibility Level
• Identify and acquire licenses for online applications training products with clearly identified technology competencies.		————————			PD, IN
• Identify and acquire web-based staff development products and programs that support teacher competencies for curriculum/technology integration at various grade levels and disciplines.		————————			IN, PD
• Partner with colleges and universities in the development of online courses that support identified teacher competencies for curriculum/technology integration practices.			————————		IN, PD
• Develop online video-based resources that provide demonstrated exemplary practices linked to available integrated unit plans or other instructional resources in support of learning standards.			————————		IN, PD, ITAF, T
• Develop facilitated online forums for the communication and sharing of successful curriculum/technology integration practice throughout LAUSD.		————————			ITAF, T
HUMAN RESOURCE MANAGEMENT AND DEVELOPMENT					
Staff Technology Competencies (continued)					
• Pilot delivery models, assess impact, and expand availability of effective models.		—————————————————			PD, IN

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	Phase I (7/1/99 to 6/30/00)	Phase II FY 2001	Phase III FY 2002	Phase IV FY 2003 and beyond	Responsibility Level
Develop and implement a competency-based Individual Staff Development Plan (ISDP) process and template.					
• Use ISDP process to assist staff in identifying technology-related and other competency development needs and in linking these with appropriate staff and development activities and delivery models.		————			PD, ITAF, S
• Develop incentive strategies to encourage and reward competency development.		———————————————			CA, LD, IN
Organizational Development and Human Resource Management					
Involve the Professional Development and Instructional Technology Branches, and the Information Technology Division in collaborative organizational development activities to improve coordination and communication.					
• Clarify major functions, roles and relationships relative to professional development.	———————				PD, IT, IN
• Determine critical interdependencies.	———————				PD, IT, IN
• Develop strategies for using technology to assess staff development needs; promote opportunities; develop and deliver programs; manage development data; and, monitor and evaluate staff development activities.		———————			PD, IT, IN

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HUMAN RESOURCE MANAGEMENT AND DEVELOPMENT					
Organizational Development and Human Resource Management (continued)					
• Develop action plans for improving technology-related staff development services provided within LAUSD.	————————				PD, IT, IN
Engage in organizational development to clarify functions, roles and responsibilities for technology support services.					
• Determine spans of authority of different branches or groups.	—————				PD, IT, IN
• Identify critical interdependencies among the various groups.	—————				PD, IT, IN
• Establish communication and collaboration protocols.	—————				PD, IT, IN
• Clarify reporting relationships.	—————				PD, IT, IN
• Develop standards of service or quality assurance criteria.		—————			PD, IT, IN
Develop, as part of a district-wide decision-support system, the capacity to store, manage, and query personnel and competency-based human resource data.					
• Accommodate competency-based human resource information as well as traditional personnel data. Include competency-based components such as: staff competencies and performance levels, job descriptions, recruitment criteria, staff development programs and activities, supervision and evaluation templates and data, and individual staff development plans.		————————			CA, IT, PD, IN

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HUMAN RESOURCE MANAGEMENT AND DEVELOPMENT					
Technology Support Staffing					
Continue to clarify the role of the new ITAF position and define their relationship to the Local District, Instructional Technology Branch, and schools they serve.					
• Document the outcomes of ITAF work sessions defining roles and relationships.	▬				IN, ITAF
• Share results throughout the Local District so all constituencies have a clear understanding of the various technology support services available, how they are accessed, and expectations for service levels.	▬▬				IN, ITAF
• Establish procedures for resolving conflicts and addressing issues relative to the ongoing implementation of the ITAF program.		▬			LD, IN, ITAF, S
Establish guidelines for school-based technology support services.					
• Establish support service guidelines based on variable criteria such as: school size, staff and student population, type of technology-supported learning environments, and anticipated level of access to technology resources.	▬				IN, T
• Provide multiple models for school-based technology staffing within "acceptable parameters of variation" to enable schools to exercise flexibility in meeting their growing technology support needs.	▬▬				IN, T

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	Phase I (7/1/99 to 6/30/00)	Phase II FY 2001	Phase III FY 2002	Phase IV FY 2003 and beyond	Responsibility Level
• Provide sample competency-based job descriptions for school-based technology support staff to assist school leadership in building a technology team.	————	————			IN, T

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TECHNOLOGY ENHANCED LEARNING ENVIRONMENTS

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Equity of Technology Resources					
Procure equipment for classrooms and other learning environments in accordance with established standards, allocation programs, and critical mass guidelines.					
• Develop a procurement and allocation program and schedule, within the parameters of anticipated resources, for instructional computers and peripherals that addresses equity of technology access throughout the Local District.	————	————			
• Define and embrace approved "critical mass" configurations for classrooms and learning environments at all levels.	———				IN
• Analyze school and Local District progress toward critical mass utilizing an inventory database populated by an online, school-based survey template.		————			IN, LD, S
• Place the district-wide inventory database online with electronic search capabilities by each school office.		————	————		IN
• Create Local District-and district-level reports from both the inventory database and procurement system that depict the distribution of quality resources, provide schools and Local Districts with comparative data, and flag inequities.		————	————	————	IN, IT

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• Assign the task of auditing and monitoring equitable access to technology resources at the Local District level.		——			IN, LD
TECHNOLOGY ENHANCED LEARNING ENVIRONMENTS					
Equity of Technology Resources (continued)					
Establish electronic access to appropriate informational and learning resources at school from home and community centers.					
• Determine appropriate instructional resources to be made available for after-hours student access and for community access.		——			IN
• Initially prioritize resources to address improved literacy skills.		——			IN
• Develop web-based strategies for community access and dissemination.		————————			IN
• Communicate the need for expanded home/school communication linkages to families and community centers and the availability of resources.		——			IN
• Maintain and improve web sites and monitor access.		————————————			IN

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Learning Environments					
Develop a master procurement/allocation plan for achieving the goal of one computer for every five students.					
• Continue to place computers in classrooms according to guidelines established in the district, school, and Local District level plans, purchasing new computers to the extent possible and maintaining labs only when appropriate to learning needs and teaching styles of the grade level/discipline.	——				IN, LD, S, ITAF
• Align and maintain computer lab environments with the instructional needs of the school.		————			IN, LD, S
TECHNOLOGY ENHANCED LEARNING ENVIRONMENTS					
Learning Environments (continued)					
• Reconfigure layouts of computer labs, as needed, to create improved cooperative learning environments.		——			S
Expand availability of portable computers to as many teachers as possible.					
• Communicate recommended choices for portable computers and built-in software.	——				IN
• Negotiate favorable pricing from vendors.	————				IN
• Research interest in and feasibility of incentive approaches for teachers.	————				IN

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• Assess the impact of teacher access to portable computers.			————————	————	IN, LD, S
Communicate information to principals and teachers regarding low-cost desktop computing devices and their potential application to learning standards.					
• Coordinate vendor demonstrations of this equipment at convenient sites throughout the Local District.		————			IN, ITAF
• Include information regarding desktop computing devices in Technology Enhanced Learning Environments document and make available to all school staff via web-site.	————				IN
TECHNOLOGY ENHANCED LEARNING ENVIRONMENTS					
Libraries					
Implement model school libraries throughout the district, transforming libraries over time to serve as information resource centers for students and staff.					
• Communicate to school leadership throughout the district the importance of the role school libraries would serve as information resource centers.		————			CA, IN, ITAF
• Convene a task force of library/media staff and administration to periodically review and maintain standards and models for school libraries that align with the districts' learning standards and include technology.		————			T
• As school buildings become networked, ensure that the school library receives priority for being connected to all classrooms.	————	————————	————		IT, IN, S

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• Ensure that district-wide professional development plans and programs target school librarians.		————————			PD, IN, LD, S
• Develop and implement a plan and timetable for automation of all school libraries/utilizing a centralized library automation system accessible to each school library via LAUSDnet.			————		IT, IN, T
• Connect as many schools as possible to L.A.'s public library system and to accessible university library systems.			————————————		T
• Develop a district-wide plan and timetable for establishing a comprehensive media management system.		————————————			T, IT
Libraries (continued)					
Expand successful models and practices regarding library-based resources					
• Access success and replicability of existing models, practices, and limited initiatives related to library-based resources.		————			T
• Design resources to be Web-enabled and accessible by all school sites and, as appropriate, from homes and community centers.		————			T, IT

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Facilities					
Ensure that guidelines for school facilities upgrades are current and will accommodate appropriate instructional technology throughout school buildings and take into consideration differences in teaching and learning needs among elementary, middle, and high school students and for special programs.					
• Establish a standard setting committee that will regularly inform and update the BB Oversight Committee on issues of technology standards and appropriate school configurations.	——				IN, IT
Help schools determine the appropriate placement of network components in order to provide the best environment at the least cost.					
• Establish Local District level technology support teams that will conduct an on site visit to each school and review its technology requirements in advance of scheduled facilities/technology upgrade.	————	——			T, IN, IT
• Provide web-based guidelines and necessary funds to enable schools to protect their networking components environmentally.		——			CA, IT
• Encourage the visitation of school leadership to exemplary technology infusion sites within the district.	————	————	————		IN, LD, S, ITAF

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TECHNOLOGY ENHANCED LEARNING ENVIRONMENTS					
Facilities (continued)					
Conduct an external audit of LAUSDnet in light of anticipated needs for delivery of efficient Internet access for all schools and interactive video district-wide.					
• Secure an audit report, with action plan and associated budget, that identifies requirements and procedures to delivery efficient Internet access and interactive video either through LAUSDnet or a separate network.	————				IN, IT
• Review audit report recommendations and develop a strategy to ensure capacity for delivery of interactive video district-wide.		——			IN, IT
In existing buildings, find ways to increase the security of technology in classrooms and labs, especially after school hours.					
• Ensure that security of technology equipment is addressed in guidelines for new construction and in BB funded renovations.	————				IT
• Authorize and allocate funding to allow schools to upgrade their security systems to incorporate protection for computers, peripherals, and other technologies wherever possible.	————				CA, LD, S

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	Phase I (7/1/99 to 6/30/00)	Phase II FY 2001	Phase III FY 2002	Phase IV FY 2003 and beyond	Responsibility Level
PLAN IMPLEMENTATION ISSUES					
Technology Standards					
Establish a standard-setting committee of representative stakeholders and adopt a process for setting and reviewing standards for all major technology components, including networks, peripherals, and system software.					
• Create a technology standards development process that: - includes activities that communicate to all stakeholders the need and benefits for standardization within parameters - allows for participation through representation by all user groups - involves vendor representatives - addresses periodic revisions that are necessitated because of technology market advances	——				IN, IT, T
• Define standards for network and workstation hardware (PC and Mac), software, and upgrades that address both technical capability and minimum capacity of equipment at classroom and building levels to help ensure equity of access across schools and to facilitate training and support.	——				T
• Design a policy that allows waivers to standards in defined situations that warrant variation, such as specific teaching situations, ongoing successful practices, and support of new technology pilots.	——				T

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	Phase I (7/1/99 to 6/30/00)	Phase II FY 2001	Phase III FY 2002	Phase IV FY 2003 and beyond	Responsibility Level
• Assign the function of oversight of technology standards to a specific person or role within the organization.	—				IN, IT, T
PLAN IMPLEMENTATION ISSUES					
Technology Standards (continued)					
• Define and communicate minimum capabilities for workstations that are aligned with teaching and curriculum strategies identifies in district and state learning standards for students.	—				T
• Support adherence to standards by providing guidance and on-site access to resources for school staff on the purchase of hardware and software suitable to their teaching needs and students' learning needs.	————				IN, ITAF
Equity					
Empower the Technology Steering Committee or a subcommittee of representative stakeholders to establish a process for reviewing and setting technology related policies and procedures for the district.					
• Establish district-wide policies and guidelines regarding critical mass of technology resources at the school and classroom levels to help ensure equity of access by all students within and among schools.	—				T

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	Phase I (7/1/99 to 6/30/00)	Phase II FY 2001	Phase III FY 2002	Phase IV FY 2003 and beyond	Responsibility Level
• To ensure a systems approach to defining critical mass, develop a school-level rubric for accessing inter-related elements of technology integration: hardware, software, network capacity, and facilities; technology support staffing; degree of curriculum integration; impact of technology integration related staff development.		——			T
PLAN IMPLEMENTATION ISSUES					
Equity (continued)					
• Have schools self-access their status regarding technology critical mass and access through use of the rubric, and communicate results to Local District and district levels.		————————————————			IN, LD, S, ITAF
Policies					
Develop policies and procedures at the school level for increasing student access to computers in libraries, labs, and classrooms throughout the school day and after school hours.					
• Provide funding, at the district level, for increased opportunities for student access throughout the school day and beyond.		——			CA
• Develop multiple strategies for monitoring, supervising, and securing computer use that supports and encourages maximization of student access.		——			T, LD, S
• Develop strategies for sharing and communication of current best practices for expansion of student access to technology resources.		——			T

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PLAN IMPLEMENTATION ISSUES					
Policies (continued)					
In collaboration with the Instructional Technology Branch, Local District and school leadership, and ITD should develop and provide a set of criteria that determine which technology policies and decisions will be made at the District level, and which policies and decisions are Local District-and/or site-based.					
• Develop consensus, adopt criteria, and communicate it effectively system-wide along with articulation of those policies that have already been established and implemented.		——			IT, IN, LD, S
• Establish and clearly define the collaborative process for developing and implementing technology policies and decision-making parameters to meet emerging needs.		——			IN, IT
• Develop online procedures that alert decision-makers to new and amended policies.		——			IN, IT
Develop clear policies and procedural guidelines regarding installation of new instructional technology equipment, upgrading and maintenance of older equipment, and phasing out of obsolete equipment.					
• Organize a joint working group of Instructional Technology Branch and ITD staff to develop policies and guidelines for installation, upgrading, and maintenance of instructional technology equipment.		——			IN, IT

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	Phase I (7/1/99 to 6/30/00)	Phase II FY 2001	Phase III FY 2002	Phase IV FY 2003 and beyond	Responsibility Level
• Post policies and guidelines on a web-site accessible to all school and Local District staff.		——			IN, IT
PLAN IMPLEMENTATION ISSUES					
Policies (continued)					
• Define obsolescence for instructional computers and peripherals.	——				IN
• Identify and communicate potential effective uses of older equipment to schools.	——				IN
• Develop "use or move" procedures by which older equipment is relocated to interested schools/classrooms for the identified purposes, or else discarded.		——			IN
• Gather and dispose of unusable equipment in environmentally safe manner.		————————————————			LD, S
Develop policies, guidelines, and standards for acceptance of donated equipment.					
• Identify LAUSD standards for acceptable computer and peripheral donations to schools and develop an appropriate communication for potential donors,		——			T
• Proactively distribute the communication to all businesses, agencies, and institutions in the region who could be potential donors.		————————			T

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	Phase I (7/1/99 to 6/30/00)	Phase II FY 2001	Phase III FY 2002	Phase IV FY 2003 and beyond	Responsibility Level
Review, upgrade, and communicate effectively, by various means to all schools and staff, the ethical and appropriate use policy.					
• Establish a process for periodically reviewing and upgrading the ethical and appropriate use policy.		——			IN
• Develop strategies for communicating the ethical and appropriate use policy, including ongoing incorporation of policies into curricular activities and projects.		——			IN, ITAF
PLAN IMPLEMENTATION ISSUES					
Policies (continued)					
• Establish procedures for monitoring compliance to ethical and appropriate use policy.		——			IN, ITAF
Procurement					
Based upon the *Information Technology Plan* recommendations and an approved district *Instructional Technology Plan* schedule and budget for technology acquisition and support on a regular basis.					
• Develop a central model and transition plan for determining the annual budget for technology acquisition and support for technology.		——			CA, IN, IT
• Adopt the technology acquisition financing model.		——			CA

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	Phase I (7/1/99 to 6/30/00)	Phase II FY 2001	Phase III FY 2002	Phase IV FY 2003 and beyond	Responsibility Level
Make informational and evaluative resources available online to all schools for aligning instructional software to priority student learning standards.					
• Develop an instructional software web-site specific to LAUSD that will be maintained and upgraded in real time.		————————			IN
• Negotiate blanket contracts for software and supplies that allow schools to order directly from vendor lists and catalogs at favorable discounts.		————————————————			IN
Develop a rules-based procurement system that will ensure that schools follow established standards on technology purchases.					
• Have ITAFs work with schools within Local Districts to identify appropriate resource staff and informational resources to assist in acquisition.		————			ITAF
PLAN IMPLEMENTATION ISSUES					
Procurement (continued)					
• Have ITAFs work with responsible district-wide staff and LAUSDnet staff in communicating processes regarding adherence of technology purchases to established standards and for meeting specific educational requirements.		————————			ITAF
• Incorporate the technology resource acquisition process into the district decision support system being designed.			————		IN, IT

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	Phase I (7/1/99 to 6/30/00)	Phase II FY 2001	Phase III FY 2002	Phase IV FY 2003 and beyond	Responsibility Level
Establish effective communications strategies for informing and updating schools, Local Districts, and programs about the status of district-wide site licenses for instructional software.					
• Identify Instructional Technology Branch personnel responsible for negotiating and monitoring the status of district-wide instructional software licenses.		———			IN
• Establish a web-site for license status updates as well e-mail notification system for ITAFs to help guide purchasing within Local Districts.		———			IN
Define minimum software standards for tool-based applications for students on each hardware platform and include as a minimum configuration for instructional workstations.					
• Establish standards for applications with consideration of present installed base as well as future requirements.		———			T
• Phase-in standards for applications with acquisition of new equipment.		———			IN, IT , LD, S
• Communicate standards to all personnel involved with the design and delivery of staff development programs.		———			IN
PLAN IMPLEMENTATION ISSUES					
Procurement (continued)					
Research and report on total cost of operation for educational technologies as applicable to educational settings.					
• Conduct research.		———			IN

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	Phase I (7/1/99 to 6/30/00)	Phase II FY 2001	Phase III FY 2002	Phase IV FY 2003 and beyond	Responsibility Level
• Provide report on total cost of operation of schools and Local Districts to assist in long term planning for technology.		——			IN
Maintenance					
Research large district models for providing support for school/Local District end-user technologies.					
• Develop an RFP to explore the most cost effective and appropriate options for maintenance and support functions for instructional technology.		——			CA, IN, IT
• If the decision is made to provide instructional technology maintenance functions with LAUSD, develop an organization chart and plan for providing support for instructional technology at the district, Local District, and school levels.		——			CA, IN, IT
• Develop an engineering plan and charter for the new help desk and customer support organization to include staffing and organization, professional training, service delivery and communications, and ongoing quality improvement processes.		——			CA, IN, IT
PLAN IMPLEMENTATION ISSUES					
Maintenance (continued)					
Replicate currently effective student-supported repair service models to other complexes and Local Districts.					
• Explore currently successful models and research national models.		——			IN

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	Phase I (7/1/99 to 6/30/00)	Phase II FY 2001	Phase III FY 2002	Phase IV FY 2003 and beyond	Responsibility Level
• Identify and document the guidelines and parameters for the establishment of success student supported repair systems.		———			IN
• Assign responsibility for implementing replication/expansion of student,		———			IN

Over time, establish a fixed asset management program as part of the district-wide decision system that:
 	
  - **stage/phases procurements**
 	
  - **tracks performance**
 	
  - **provides preventive maintenance**
 	
  - **uses inventory information for decision support**					

• Establish a highly coordinated, fixed asset management plan and supporting database application to help avoid problems throughout the asset life cycle.			———		IT
• Ensure that the fixed asset management program interfaces effectively with procurement components of the decision support system.			———		IT

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	Phase I (7/1/99 to 6/30/00)	Phase II FY 2001	Phase III FY 2002	Phase IV FY 2003 and beyond	Responsibility Level
PLAN IMPLEMENTATION ISSUES					
District Planning					
Establish a permanent central planning organizational structure to develop, coordinate, implement, and monitor major district-wide planning efforts.					
• Establish a strategic framework and charter for a central planning office within LAUSD within Schools, Curriculum, and Instruction.		————			CA
• Determine critical priorities for district-level planning.		————			CA
• Develop research-based planning models and guidelines, and implementation, monitoring and evaluation systems to ensure quality, coordination, and accountability.		————			CA

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PLAN IMPLEMENTATION ISSUES					
District Planning(continued)					
• Ensure that planning emphasizes the connections and interdependencies among all initiatives and their support of district-wide goals.		———			CA
Expand the capacity and functionality of the Grants Assistance Office to provide more guidance and technical assistance in the preparation of grants at the school, Local District, and district levels.					
• Establish criteria for determining high-leverage grant opportunities.		———			GAO, IN
• Establish a web-site location for grant-related information.		———			GAO, IN
• Explore expansion of grant assistance personnel through a fee-for services arrangement funded by the district.		———			CA. GAO, IN
School-level Planning					
Establish a district-wide model for school-based planning					
• Provide schools with planning models, web-based templates, and materials to be used in the development of strategic school improvement plans that address priorities relative to: student achievement, curriculum, staff development, and technology integration.		———			CA, LD, S

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	Phase I (7/1/99 to 6/30/00)	Phase II FY 2001	Phase III FY 2002	Phase IV FY 2003 and beyond	Responsibility Level
• Incorporate stakeholder input and research-based critical success factors in the development of standards and models for school improvement plans.		——			CA, LD, S

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PLAN IMPLEMENTATION ISSUES					
School-level Planning(continued)					
• Ensure accountability by developing school-level planning models that incorporate strategies for monitoring and evaluation of plan implementation.		——			CA, LD, S
• Develop models for recommended technology configurations from classrooms, computer labs, school libraries, and other resource areas; and, share with schools for use in technology planning.		——			CA, LD, S
• Establish evaluation criteria that reflect district standards for school-level plans.		——			CA, LD, S
• Identify and assign responsibility for providing evaluative feedback and remediation support for school planning efforts.		——			CA. LD. S
Local district-and Program-level Planning					
Develop planning standards, models, templates, and resources to guide Local District-and program-level educational improvement and technology planning efforts.					
• Provide Local District and program leadership with planning models, web-based templates, and materials to be used in the development of strategic improvement plans.		——			CA, LD, S
• Identify obstacles to full utilization of technology tools to support planning efforts at all levels.		——			CA, LD, S

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	Phase I (7/1/99 to 6/30/00)	Phase II FY 2001	Phase III FY 2002	Phase IV FY 2003 and beyond	Responsibility Level
• Develop strategies for full utilization of technology tools to address and eliminate identified obstacles.		▬▬▬			CA, LD, S
• Incorporate stakeholder input and research-based critical success factors in the development of standards and models for Local District and program plans.		▬▬▬			CA, LD, S

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PLAN IMPLEMENTATION ISSUES					
Community Learning					
Seek ways to increase the number of technology-based community learning programs and mutually beneficial technology-focused formal relationships, allowing both the school population and the community-at-large to benefit from and contribute to available technology resources.					
• Develop and disseminate a catalog and web-based resources that describe in detail some exemplary national, regional, and local technology-based community learning programs.		———			CA, IN
• Establish guidelines and support for assisting schools and Local Districts in establishing programs that foster and encourage access to technology resources for after school programs in schools and throughout the community for children and adult community members.		———			CA, IN, S
• Plan and conduct a citywide information and planning session, highlighting existing community learning programs, and how to successfully established fund, and market technology-based community learning programs.			———		CA, IN

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	Phase I (7/1/99 to 6/30/00)	Phase II FY 2001	Phase III FY 2002	Phase IV FY 2003 and beyond	Responsibility Level
Expand existing technology partnerships and promote new technology partnerships with higher education, business, and industry.					
• Plan and conduct a School Technology Partnership Summit that will focus educating school department personnel and community leadership on currently successful partnerships, expansion of existing relationships, and promoting new partnerships with high education, business, and industry.			▬		IN

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	Phase I (7/1/99 to 6/30/00)	Phase II FY 2001	Phase III FY 2002	Phase IV FY 2003 and beyond	Responsibility Level
PLAN IMPLEMENTATION ISSUES					
Community Learning (continued)					
Enable sharing of data and information within and among school sites, health and service organizations, courts, and city and state agencies as part of a comprehensive student database within the proposed decision support system.					
• Assess status of parent and community access needs as to hardware, software, and training.			———		IN, LD, S
• Increase access to hardware, software, the Internet, and training to address and facilitate parent and community needs, partnerships, and linkages with city and state agencies.			———————		LD, S
• Identify and address equipment, security, and technical issues associated with cross-agency sharing of data and information.			———		IN, IT

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APPENDICES

Appendix A:
Planning Foundations

National Educational Technology Standards (NETS)
For All Students

The ***Technology Foundation Standards*** for students are divided into six broad categories:

- Basic operations and concepts
- Social, ethical, and human issues
- Technology productivity tools
- Technology communications tools
- Technology research tools
- Technology problem-solving and decision-making tools

Standards within each category are to be introduced, reinforced, and mastered by students. These categories provide a framework for linking performance indicators found within the Profiles for Technology Literate Students to the standards. Teachers can use these standards and profiles as guidelines for planning technology-based activities in which students achieve success in learning, communication, and life skills.

A major component of the NETS Project is the development of a general set of profiles describing technology literate students at key developmental points in their pre-college education. These profiles reflect the underlying assumption that all students should have the opportunity to develop technology skills that support learning, personal productivity, decision-making, and daily life. These profiles and associated standards provide a framework for preparing students to be lifelong learners who make informed decisions about the role of technology in their lives.

The ***Profiles for Technology Literate Students*** provide performance indicators describing the technology competence students should exhibit upon completion of the following grade ranges:

- Grades Pre-K - 2
- Grades 3 - 5
- Grades 6 - 8
- Grades 9 - 12

These profiles are indicators of achievement at certain stages in Pre K-12 education. They assume that technology skills are developed by coordinated activities that support learning throughout a student's education. These skills are to be introduced, reinforced, and finally mastered, and thus, integrated into an individual's personal learning and social framework. They represent essential, realistic, and attainable goals for lifelong learning and a productive citizenry.

The standards and performance indicators are based on input and feedback from educational technology experts as well as parents, teachers, and curriculum experts. In addition they reflect information collected from the professional literature and local, state, and national documents.

Technology Foundation Standards for Students

1.   Basic operations and concepts

- Students demonstrate a sound understanding of the nature and operation of technology systems.

- Students are proficient in the use of technology.

2.   Social, ethical, and human issues

- Students understand the ethical, cultural, and societal issues related to technology.

- Students practice responsible use of technology systems, information, and software.

- Students develop positive attitudes toward technology uses that support lifelong learning, collaboration, personal pursuits, and productivity.

3.   Technology productivity tools

- Students use technology tools to enhance learning, increase productivity, and promote creativity.

- Students use productivity tools to collaborate in constructing technology-enhanced models, preparing publications, and producing other creative works.

4.   Technology communications tools

- Students use telecommunications to collaborate, publish, and interact with peers, experts, and other audiences.

- Students use a variety of media and formats to communicate information and ideas effectively to multiple audiences.

5.   Technology research tools

- Students use technology to locate, evaluate, and collect information from a variety of sources.

- Students use technology tools to process data and report results.

- Students evaluate and select new information resources and technological innovations based on the appropriateness to specific tasks.

6.   Technology problem-solving and decision-making tools

- Students use technology resources for solving problems and making informed decisions.

- Students employ technology in the development of strategies for solving problems in the real world.

Profiles for Technology Literate Students

GRADES Pre-K – 2

Performance Indicators:

All students should have opportunities to demonstrate the following performances.

Prior to completion of Grade 2 students will:

- Use input devices (e.g., mouse, keyboard, remote control) and output devices (e.g., monitor, printer) to successfully operate computers, VCRs, audiotapes, and other technologies. (1)

- Use a variety of media and technology resources for directed and independent learning activities. (1, 3)

- Communicate about technology using developmentally appropriate and accurate terminology. (1)

- Use developmentally appropriate multimedia resources (e.g., interactive books, educational software, elementary multimedia encyclopedias) to support learning. (1)

- Work cooperatively and collaboratively with peers, family members, and others when using technology in the classroom. (2)

- Demonstrate positive social and ethical behaviors when using technology. (2)

- Practice responsible use of technology systems and software. (2)

- Create developmentally appropriate multimedia products with support from teachers, family members, or student partners. (3)

- Use technology resources (e.g., puzzles, logical thinking programs, writing tools, digital cameras, drawing tools) for problem solving, communication, and illustration of thoughts, ideas, and stories. (3, 4, 5, 6)

- Gather information and communicate with others using telecommunications, with support from teachers, family members, or student partners. (4)

Profiles for Technology Literate Students

GRADES 3 – 5

Performance Indicators:

All students should have opportunities to demonstrate the following performances.

Prior to completion of Grade 5 students will:

- Use keyboards and other common input and output devices (including adaptive devices when necessary) efficiently and effectively. (1)

- Discuss common uses of technology in daily life and the advantages and disadvantages those uses provide. (1, 2)

- Discuss basic issues related to responsible use of technology and information and describe personal consequences of inappropriate use. (2)

- Use general-purpose productivity tools and peripherals to support personal productivity, remediate skill deficits, and facilitate learning throughout the curriculum. (3)

- Use technology tools (e.g., multimedia authoring, presentation, Web tools, digital cameras, scanners) for individual and collaborative writing, communication, and publishing activities to create knowledge products for audiences inside and outside the classroom. (3, 4)

- Use telecommunications efficiently and effectively to access remote information, communicate with others in support of direct and independent learning, and pursue personal interests. (4)

- Use telecommunications and online resources (e.g., e-mail, online discussions, Web environments) to participate in collaborative problem-solving activities for the purpose of developing solutions or products for audiences inside and outside the classroom. (4, 5)

- Use technology resources (e.g., calculators, data collection probes, videos, educational software) for problem solving, self-directed learning, and extended learning activities. (5, 6)

- Determine when technology is useful and select the appropriate tool(s) and technology resources to address a variety of tasks and problems. (5,6)

- Evaluate the accuracy, relevance, appropriateness, comprehensiveness, and bias of electronic information sources. (6)

Profiles for Technology Literate Students

GRADES 6–8

Performance Indicators:

All students should have opportunities to demonstrate the following performances.

Prior to completion of Grade 8 students will:

- Apply strategies for identifying and solving routine hardware and software problems that occur during everyday use. (1)

- Demonstrate knowledge of current changes in information technologies and the effect those changes have on the workplace and society. (2)

- Exhibit legal and ethical behaviors when using information and technology, and discuss consequences of misuse. (2)

- Use content-specific tools, software, and simulations (e.g., environmental probes, graphing calculators, exploratory environments, Web tools) to support learning and research. (3,5)

- Apply productivity/multimedia tools and peripherals to support personal productivity, group collaboration, and learning throughout the curriculum. (3, 6)

- Design, develop, publish, and present products (e.g., Web pages, videotapes) using technology resources that demonstrate and communicate curriculum concepts to audiences inside and outside the classroom. (4, 5, 6)

- Collaborate with peers, experts, and others using telecommunications and collaborative tools to investigate curriculum-related problems, issues, and information, and to develop solutions or products for audiences inside and outside the classroom. (4, 5)

- Select and use appropriate tools and technology resources to accomplish a variety of tasks and solve problems. (5, 6)

- Demonstrate an understanding of concepts underlying hardware, software, and connectivity, and of practical applications to learning and problem solving. (1, 6)

- Research and evaluate the accuracy, relevance, appropriateness, comprehensiveness, and bias of electronic sources concerning real-world problems. (2, 5, 6)

Profiles for Technology Literate Students

GRADES 9–12

Performance Indicators:

All students should have opportunities to demonstrate the following performances.

Prior to completion of Grade 12 students will:

- Identify capabilities and limitations of contemporary and emerging technology resources and assess the potential of these systems and services to address personal, lifelong learning, and workplace needs. (2)

- Make informed choices among technology systems, resources, and services. (1, 2)

- Analyze advantages and disadvantages of widespread use and reliance on technology in the workplace and in society as a whole. (2)

- Demonstrate and advocate for legal and ethical behaviors among peers, family, and community regarding the use of technology and information. (2)

- Use technology tools and resources for managing and communicating personal/professional information (e.g., finances, schedules, addresses, purchases, correspondence). (3, 4)

- Evaluate technology-based options, including distance and distributed education, for lifelong learning. (5)

- Routinely and efficiently use online information resources to meet needs for collaboration, research, publication, communication, and productivity. (4, 5, 6)

- Select and apply technology tools for research, information analysis, problem solving, and decision making in content learning. (4, 5)

- Investigate and apply expert systems, intelligent agents, and simulations in real-world situations. (3, 5, 6)

- Collaborate with peers, experts, and others to contribute to a content-related knowledge base by using technology to compile, synthesize, produce, and disseminate information, models, and other creative works. (4, 5, 6)

Appendix B:
Staff Technology Competencies

Introduction

The following seven pages include four performance levels for each of the Teacher Technology Competencies. The identification of performance levels enables staff to consider their technology competency growth on a continuum. The performance levels can be most useful when incorporated into the written descriptions of staff development activities. By identifying the specific performance level that will be addressed in each technology-related staff development program, teachers can make better choices as to the activities that are most appropriate to their needs. The performance levels will enable the different individuals, groups and departments providing technology-related professional development to coordinated development efforts and reduce redundancies and gaps in service delivery. The performance levels also provide staff with a common language for discussing professional growth and development priorities.

During the December 3, 1999, ITAF work session, the importance of the district adopting a consistent set of Teacher Technology Competencies and Performance Levels was discussed. The consensus was strong among the ITAFs that one standard set was essential to continuity in professional development programs across the district. It was also noted that district-wide consistency would be helpful to teachers who transfer to schools in different Local Districts. Therefore, the *Instructional Technology Blueprint* strongly recommends that the Teacher Technology Competencies and Performance Levels be adopted and promoted district-wide.

Teacher Technology Competencies and Performance Levels

CATEGORY 1: Ethical and Legal Use of Technology

1.1   Understands, models and promotes ethical and legal use of information technology.

1.1.1 Foundational Level

Recognizes importance of, and models adherence to, copyright law as it applies to using technology resources, including digital and video media, in daily practice.

1.1.2 Intermediate Level

Promotes school-based dialogue on the legal and ethical use of technology among students and colleagues, including issues such as: changes in laws, fair use, equitable access, privacy and confidentiality, computer viruses, illegal hacking, free speech and censorship, harassment, pornography, hate mail, personal safety, etc. Promotes adherence to legal and ethical standards in student projects and discussions of technology-based solutions to societal problems.

1.1.3 Advanced Level

Engages with students and colleagues in collaborative rule making and self-regulation related to ethical and legal use of technology. Provides input to policy formation.

1.1.4 Mentor/Coach Level

Provides formal and/or informal training to enable others to develop this competency.

CATEGORY 2: Basic Computer Operations and Troubleshooting

2.1   Uses basic computer systems and performs simple troubleshooting for computer systems and related peripherals.

2.1.1 Foundational Level

Uses basic computer systems, operations, and peripherals to perform simple tasks (e.g., boots up machines and loads/launches programs, saves and retrieves files to disk and hard drive, install software, select printers, etc.).

2.1.2 Intermediate Level

Uses basic computer systems, operations, and peripherals to perform more advanced tasks such as navigate a variety of graphical user interfaces; operate peripheral devices (e.g., VCR, monitor, laserdisc player, CD-ROM player, modem, scanner, fax machine, etc.); create directories; navigate through the network directory, etc.).

2.1.3 Advanced Level

Performs simple troubleshooting of computer systems and related peripherals (e.g., operates virus scan, checks connections, reinstalls software, checks file extensions and software versions for compatibility, etc.).

2.1.4 Mentor/Coach Level

Provides formal and/or informal training to enable others to develop this competency.

CATEGORY 3: Word Processing and Desktop Publishing

3.1   Uses productivity features of word processing.

    3.1.1 Foundational Level

    Uses basic word processing functions to create syllabi, lesson plans, tests, class lists, reading lists, communications, etc.

    3.1.2 Intermediate Level

    Uses more advanced word processing functions (e.g., inserts tables; creates table of contents; inputs headers/footers, formats documents; etc.) to create reports, papers, and communications.

    3.1.3 Advanced Level

    Integrates other productivity applications into word-processed documents (e.g., spreadsheets, databases, graphics, etc.).

    3.1.4 Mentor/Coach Level

    Provides formal and/or informal training to enable others to develop this competency.

3.2   Utilizes productivity features of desktop publishing and graphics programs and utilities.

    3.2.1 Foundational Level

    Uses basic desktop publishing features (e.g., layout, margins) and graphics (e.g., import/export and draw functions) to create announcements, bulletins, etc.,

    3.2.2 Intermediate Level

    Uses more advanced desktop publishing and graphics features to edit and manipulate newsletters and other complex document templates (e.g., multi-layered images; master pages; shading; snap-to grids; translate, scale, crop, and rotate objects; scanners).

    3.2.3 Advanced Level

    Uses complex desktop publishing and graphics features (e.g., multi-layered images; master pages; shading; snap-to grids; translate, scale, crop, and rotate objects; scanners) to create templates and other complex documents.

    3.2.4 Mentor/Coach Level

    Provides formal and/or informal training to enable others to develop this competency.

CATEGORY 4: Spreadsheets and Databases

4.1   Uses spreadsheets for analyzing, organizing, and graphically displaying numerical data.

    4.1.1 Foundational Level

    Uses pre-construct spreadsheets to store, analyze and present data.

    4.1.2 Intermediate Level

    Designs and constructs simple spreadsheets using row/column setup, print area setup, sort function, borders and lines, addition and subtraction. Provides opportunities for students to use spreadsheet data to predict and analyze hypotheses, assumptions, and arguments.

    4.1.3 Advanced Level

    Uses more advanced features/formulas of spreadsheets to compute, analyze and present calculations for budgets (complex calculations, graphs, etc.). Designs and constructs complicated interrelated spreadsheets for computing and presenting complex calculations and relationships (e.g., multiple worksheets).

    4.1.4 Mentor/Coach Level

    Provides formal and/or informal training to enable others to develop this competency.

4.2   Develops and manages databases (including the LAUSD Student Information System (SIS)), and generates customized reports.

    4.2.1 Foundational Level

    Accesses and manipulates existing databases to generate reports.

    4.2.2 Intermediate Level

    Develops and creates customized databases, or database subsets, to manipulate data and generate customized reports.

    4.2.3 Advanced Level

    Merges data from multiple databases, executes complex queries, and imports data to a variety of other productivity applications (e.g., word processing, spreadsheets) to communicate and present data.

    4.2.4 Mentor/Coach Level

    Provides formal and/or informal training to enable others to develop this competency.

CATEGORY 5: Telecommunications and Research

5.1   Communicates and shares information through e-mail.

5.1.1 Foundational Level

Uses basic e-mail functions to communicate and share information, and as a tool for professional development (e.g., sends and receives attachments; formats text; organizes messages into folders, etc.).

5.1.2 Intermediate Level

Uses full range of e-mail features to communicate and share information (e.g., uses address book; finds appropriate newsgroups/listservs and downloads messages for offline reading; etc.).

5.1.3   Advanced Level

Uses more complex e-mail features to communicate and share information (e.g., compresses and decompresses files; translates attachments into different formats; customizes e-mail windows; operates Internet browser from e-mail, etc.).

5.1.4 Mentor/Coach Level

Provides formal and/or informal training to enable others to develop this competency.

5.2   Researches and evaluates online information.

5.2.1 Foundational Level

Uses school/district databases, including those provided by instructional publishers, to research information. Evaluates the appropriateness and quality of information resources. Integrates online resources into reports, presentations, spreadsheets, etc. Understands and promotes district's Internet Use Policy. Engages students in discussion of issues of personal safety and Internet use.

5.2.2 Intermediate Level

Uses web browsers, online search engines to research information. Customizes web browsers. Promotes student evaluation of the appropriateness and quality of information resources. Uses and promotes safe search protocols (e.g., uses virus scanning software; protects computer from unsafe software; uses secure Internet sites; protects password and credit card information; etc.). Storing and organizing bookmarks.

5.2.3 Advanced Level

Uses advanced syntax and search processes, and builds complex search strategies to effectively and efficiently obtain information resources. Uses telecommunications to access professional development resources. Imports text/graphics/video from web sites.

5.2.4 Mentor/Coach Level

Provides formal and/or informal training to enable others to develop this competency.

CATEGORY 6: Instructional Design and Learning Environment Management

6.1   Applies instructional design theories and principles to the integration of technology tools and applications into instructional units.

> **6.1.1 Foundational Level**
>
> Integrates content-appropriate, easily accessible technology resources into instructional units/lessons and instructional practices (e.g., presentation tools, graphing applications, video, simulations, probes and sensors, CD-ROM, projection devices, adaptive/assistive devices, etc.).
>
> **6.1.2 Intermediate Level**
>
> Integrates multimedia software and equipment into instructional practices; and integrates use of web sites, bookmarks, and search engines into instructional units/lessons.
>
> **6.1.3 Advanced Level**
>
> Creates simulations to facilitate exploratory and discovery learning. Uses appropriate software for animations and diagrams. Utilizes pedagogic guidelines for synchronous and asynchronous distance learning, including: web-based courses, satellite courses, teleconferencing, e-mail-based courses, data manipulation technologies, etc.,
>
> **6.1.4 Mentor/Coach Level**
>
> Provides formal and/or informal training to enable others to develop this competency.

6.2   Applies knowledge of learning environment dynamics to the effective integration of technology tools and applications to teaching and learning (e.g., using simulations or technology-supported cooperative learning activities to support exploratory/discovery learning and critical thinking; managing the learning environment to promote effective interaction among instructional staff, students, and technology resources; etc.).

> **6.2.1 Foundational Level**
>
> Selects and manages appropriate, basic technology tools to optimize human interaction and learning (e.g., presentation tools, graphing applications, video, CD-ROM, simulations, probes and sensors, projection devices, etc.). Understands the strengths and challenges of incorporating a variety of technologies into different learning environments, and uses this knowledge to select the most appropriate mix of resources, structures, and processes.
>
> **6.2.2 Intermediate Level**
>
> Selects and manages appropriate, intermediate level technology tools to optimize human interaction and learning (e.g., multimedia, web searches, web-based courses, satellite courses, teleconferencing, e-mail-based courses, data manipulation technologies, etc.).
>
> **6.2.3 Advanced Level**
>
> Researches, pilots, and assesses the effectiveness/appropriateness of new and emerging instructional technologies within different learning environments.
>
> **6.2.4 Mentor/Coach Level**
>
> Provides formal and/or informal training to enable others to develop this competency.

6.3　Uses technology tools to enhance teaching and instructional delivery (e.g., presentation software, video, slides, projection devices, simulations, probes and sensors, "smart classrooms," etc.).

6.3.1　Foundational Level

Uses videos, slides, and projection devices to enhance teaching and instructional delivery. Understands basic design principles and capabilities of presentation software.

6.3.2　Intermediate Level

Uses text-based presentation software, "smart classrooms" technologies, and content-appropriate data manipulation devices (probes, simulations, sensors) to enhance teaching and instructional delivery.

6.3.3　Advanced Level

Uses advanced features of presentation software (including video clips, graphics, sound clips) to enhance teaching and instructional delivery.

6.3.4　Mentor/Coach Level

Provides formal and/or informal training to enable others to develop this competency.

6.4　Uses appropriate, research-based, technology-supported assessment practices to evaluate student learning.

6.4.1　Foundational Level

Uses word-processed student writing samples with performance measures/rubrics to evaluate student learning (e.g., essays, papers, etc.).

6.4.2　Intermediate Level

Uses technology-generated or supported student projects with performance measures/ rubrics to evaluate student learning (e.g., electronic presentations, demonstrations, models, videos, and creative/graphic arts, etc.).

6.4.3　Advanced Level

Uses electronic portfolios including various types of technology-supported student work with performance measures/rubrics to evaluate student learning.

6.4.4　Mentor/Coach Level

Provides formal and/or informal training to enable others to develop this competency.

Appendix C:
Instructional Unit Plan Model

Sample Instructional Unit Plan

Title:	Theme/Unifying Question:
Westward Ho!	Hardships and obstacles encountered in the westward expansion of the United States

Contributors:

Robert Milley and Marcia Kaplan, CELT Elementary School

Grade Level(s): 4, 5

Subject Area(s): Social Studies, Language Arts, Music, Art, Literature (Reading), Science, Technology, Math

Course(s):

Goals/Standards:

1. Students will gain a greater understanding of the necessity of the westward expansion.

2. Students will become aware of hardships and obstacles that the pioneers faced as they moved west.

3. Students will experience and appreciate different perspectives concerning the westward movement.

4. Students will describe growth and change in America, to 1861

References:

1-3. School district Social Studies Curriculum Guide

4. State Curriculum Frameworks in History and Social Science, Grades 5 – 8

Instructional Rationale:

Students deserve an opportunity to learn beyond established curriculum guidelines. This unit provides:

- factual historical knowledge
- experiences involving personal and group interactions to heighten:
  - multicultural perspective awareness
  - environmental awareness
  - individual and group struggles
  - varied learning experiences
  - numerous modalities incorporated
  - individual pacing
  - alternative assessment

Materials/Equipment:

1. textbook with anthology
2. computer and presentation kit
3. tape recorder
4. TV with cable access and VCR
5. Internet access
6. trade books:
   - Sarah Plain & Tall
   - Little House on the Prairie
   - Great Little Madison
   - Freedom Train
   - Where the Sidewalk Ends
7. software: Oregon Trail (MECC)

Timeframe/Schedule:

The timeframe may vary from instructor to instructor depending on the individual's scheduling. Two to three weeks for an hour and a half each day is recommended.

Instructional Design:

A. *CONTENT OBJECTIVES*

After completing this unit, students will have:

    1. learned how the westward movement impacted the growth of the country

    2. understood the concept of manifest destiny

    3. learned the key leadership in the westward movement

    4. demonstrated an understanding of the motivation for the westward expansion

    5. recognized the dangers and obstacles to the settlers

B. *PROCESS SKILLS*

After completing this unit, students will have:

    1. demonstrated proficiency in outlining and paraphrasing as note-taking techniques

    2. used the multi-step writing process from research through publication

    3. expressed empathy toward minority populations affected by mass westward expansion through oral presentations and debates

    4. researched historical movements and events

C. *TECHNOLOGY COMPETENCIES*

After completing this unit, students will:

    1. identify geographical and physical characteristics using online research sources

    2. use database to collect, compare, and analyze data

    3. upload and download written work via modem

Classroom Management/Organization:

Classroom organization will involve several grouping styles:

    • classroom presentations involving whole class groupings

    • computer discussion groups

Prerequisites:

1. keyboarding skills

2. basic math computations (+,-,x,~)

3. writing process skills

4. use of menu bar (file, edit)

5. ability to create and edit written work using the word processor

6. access floppy disks and CD-ROMs

Instructional Activities, Strategies, and Products:

Week 1:

1. Introduce unit using a film, such as "How the West Was Won."

2. Present the "Oregon Trail" (MECC) software to the whole class.

3. Divide class into wagon trains detailing their travels along the Oregon Trail via the computer program.

Week 2:

1. Create literary groups to read and present chosen trade books.

2. Use the music contained in the Anthology to reinforce the period. Have students create their own songs about their experiences along the Oregon Trail using established melodies.

3. Set up debate teams to express opinions of previously mentioned groups. Create rubrics to establish point system for debate.

4. Incorporate art activities to reinforce research such as creating tombstones, quilts, Conestoga wagons, log cabins, and 3-D maps.

5. Provide a physical education enrichment activity such as square dancing.

Week 3:

1. Integrate science through study of simple machines and their influence on westward expansion (e.g., plow and barbed wire). Have students invent a simple machine.

2. Have students create a list of pertinent Internet sites.

3. Include Snyder Park Western Days, a group chuckwagon luncheon, and display students' works as culminating activities.

Assessment Strategies:

The following assessment strategies should be used:

*   85% mastery on the textbook unit assessment

*   3-D scaled map detailing their students' progress along the Oregon Trail utilizing narrative prose

*   rubrics

*   standardized tests (textbook material)

*   participation/teacher observation

*   small group projects evaluated by peers as well as teacher

Teacher Notes:	Resources and Support:
Teaching strategies may be adapted to technologies available. Technologies such as scanners, Quick Take cameras, Viewcams, etc., may also be incorporated to enrich presentations, if available.	volunteers and chaperones trade books on the westward movement food for chuckwagon luncheon

Appendix D:
School-Based Assessment Rubric

Rubric Assessment Instrument

Variable	Indicator	Level 1	Level 2	Level 3	Level 4
Access	Connection	No connection exists between classrooms or with outside resources.	Some part of school is connected to Internet, district-wide network, or intrabuilding network.	Some part of school is connected to Internet, district-wide network, and intrabuilding network.	Entire school is connected to Internet, district-wide network, and intrabuilding network.
	Universality	Technology resources and equipment are located centrally.	Technology resources and equipment are in a few locations and convenient for some individual use.	Technology resources and equipment are in several locations in the building and convenient for individual use by several users.	Technology resources and equipment are pervasive and conveniently located for individual use.
	Interconnective	Few students and teachers interact by communicating and collaborating in diverse ways.	Some students and teachers interact by communicating and collaborating in diverse ways.	Many students and teachers interact by communicating and collaborating in diverse ways.	Students and teachers interact by communicating and collaborating in diverse ways.
	Equitable use	Few/No students have access to rich, challenging learning opportunities and interactive, generative instruction.	Some (select) students have access to rich, challenging learning opportunities and interactive, generative instruction.	Many students have access to rich, challenging learning opportunities and interactive, generative instruction.	All students have access to rich, challenging learning opportunities and interactive, generative instruction.
Organization	Distributed	Technology/system resources are completely centralized.	Technology/system resources are quite centralized.	Technology/system resources are somewhat centralized.	Technology/system resources are not centralized but exist across any number of people, environments, and situations.
	Designed for user contribution	Users cannot provide input/resources to the technology/system.	In some instances, users can provide input/resources to the technology/system.	In many instances, users can provide input/resources to the technology/system.	Users can provide input/resources to the technology/system on demand.

Variable	Indicator	Level 1	Level 2	Level 3	Level 4
	Designed for collaborative projects	Technology cannot communicate among users with diverse systems/equipment.	Technology can communicate among users with diverse systems/equipment with great difficulty.	Technology can communicate among users with diverse systems/equipment with some difficulty.	Technology is designed to facilitate communication among users with diverse systems/equipment.
Engagability	Access to challenging tasks	Technology offers no opportunities that stimulate thought and inquiry.	Technology offers few users access to tasks, data, and learning opportunities that stimulate thought and inquiry.	Technology offers many users access to tasks, data, and learning opportunities that stimulate thought and inquiry.	Technology offers or allows access to tasks, data, and learning opportunities that stimulate thought and inquiry.
	Enables learning by doing	Technology offers little access to simulations, goals-based learning, and real-world problems.	Technology offers some access to simulations, goals-based learning, and real-world problems.	Technology offers significant access to simulations, goals-based learning, and real-world problems.	Technology offers pervasive access to simulations, goals-based learning, and real-world problems.
	Provides guided participation	Technology is single-purpose, one-dimensional and offers no alternative routes.	Very little technology responds intelligently to user or is able to diagnose and prescribe new learning.	Some technology is able occasionally to diagnose and prescribe new learning.	Technology responds intelligently to user and is able to diagnose and prescribe new learning.
Ease of use	Effective Helps	Technology provides no help.	Technology provides few help indices that explain the procedures for using the technology.	Technology provides some help indices that explain clearly the procedures for some tasks and routines.	Technology provides help indices that are more than glossaries; may provide procedures for tasks and routines.
	User friendliness	Technology does not facilitate use.	Technology often fails to help the user or allow access to data and tools as they are needed.	Technology often helps the user and usually allows the user to access data and tools as they need them.	Technology facilitates user and is free from overly complex procedures; user can easily access data and tools on demand.

Variable	Indicator	Level 1	Level 2	Level 3	Level 4
	Speed	Technology is often slow and is usually down for long periods of time.	Technology is sometimes slow and down for long periods of time.	Technology has a reasonable speed and is rarely down for long periods of time.	Technology has a fast processing speed and is not 'down' for long periods of time.
	Available training and support	Training and ongoing support are not available.	Training is sporadically available. Ongoing support is often not available.	Training is available at a remote site. Ongoing support is available, but not immediately.	Training is readily and conveniently available, as is ongoing support.
	Provides just enough information just in time.	Technology allows for minimal access and minimal types of information.	Technology allows for controlled access, single point of entry and static range of levels and types of information.	Technology allows for random access, single point of entry and a narrow range of levels and types of information.	Technology allows for random access, multiple points of entry, and different levels and types of information.
Functionality	Diverse Tools	Technology does not enable access to tools basic to learning and working in the 21st Century.	Technology enables access to some diversity of generic and context-specific tools basic to learning and working in the 21st century.	Technology enables access to much diversity of generic and context-specific tools basic to learning and working in the 21st century.	Technology enables access to full diversity of generic and context-specific tools basic to learning and working in the 21st century.
	Media use	Technology provides little/no opportunity to use media technologies.	Technology provides few opportunities to use media technologies.	Technology provides some opportunities to use media technologies.	Technology provides opportunities to use media technologies.
	Links student data, learning objectives, resources, and assessments	Teachers have little/no electronic access to information regarding curriculum objectives, resources, or assessment data.	Teachers can access curriculum information, and/or data on resources, assessments, and students' performance, but these are not linked.	Teachers can access linked information on learning outcomes and available resources.	Technology enables teacher access to components of a curriculum development/learning management system.
	Supports project design skills	Technology does not facilitate the development of skills related to project design and implementation.	Technology facilitates little development of skills related to project design and implementation.	Technology facilitates some development of skills related to project design and implementation.	Technology facilitates the development of skills related to project design and implementation.