Preliminary Educational Technology Subject Matter Requirements

Content Domains for Subject Matter Understanding and Skill in Preliminary Educational Technology

As computer-based technology becomes increasingly important in contemporary society, students and educators alike must become competent and confident in their ability to use computer-based technological tools. The foundational knowledge and skills needed to integrate computer-based technology effectively into the educational context are contained in the <u>Standards of Quality and Effectiveness for Professional Teacher Preparation Programs</u> (California Commission on Teacher Credentialing, 2001), Program Standard 9. Candidates demonstrate a basic understanding of computer operations and care, as well as an understanding of legal, ethical, privacy, security, and safety issues related to the use of computer-based technology in the classroom. Candidates demonstrate knowledge of the ways in which computer-based technology may enhance productivity. Finally, candidates demonstrate their knowledge of teaching and learning applications of computer-based technology to improve student academic achievement.

Domain 1.   Basic Operations, Concepts, and Issues of Computer-Based Technology

1.1   Basic Principles of Computer Hardware and Software Operation and Care
   a. Demonstrate knowledge of kinds and functions of hardware and software.
   b. Demonstrate knowledge of startup and shutdown sequences.
   c. Demonstrate knowledge of methods for using and caring for information storage devices and removable media.
   d. Demonstrate an understanding of how to use and care for input/output devices, including presentation devices, scanners, digital cameras and video recorders, and printers.
   e. Demonstrate knowledge about viruses and methods for virus prevention.
   f. Demonstrate an understanding of how to access files in local and remote locations.
   g. Demonstrate an understanding of how to access files in multiple formats.
   h. Demonstrate an understanding of how to use and manage shared files.
   i. Demonstrate an understanding of network connectivity and logon procedures.

1.2   Basic Troubleshooting for Computers and Related Peripheral Devices
   a. Demonstrate knowledge of basic troubleshooting procedures for identifying hardware, software, and connectivity problems.
   b. Demonstrate an understanding of when to access the appropriate avenue of technical support.
   c. Understand and use appropriate terminology to articulate information relating to hardware, software, and connectivity problems.

1.3   Acceptable Use Policies and Legal and Ethical Issues
   a. Demonstrate knowledge of the scope and jurisdiction of local acceptable use policies (AUPs) and state and federal laws relating to use of computer-based technology.
   b. Demonstrate an understanding of teacher and student rights and responsibilities regarding Internet/intranet and e-mail use as defined in an acceptable use policy.
   c. Demonstrate an understanding of responsibility and liability issues related to violations of intellectual property rights (e.g., software piracy, plagiarism) and infrastructure security (e.g., unauthorized access or modifications to a computer network).
   d. Demonstrate an understanding of responsibility and liability issues related to various electronic media licensing arrangements.
   e. Demonstrate knowledge of the provisions of current copyright laws regarding electronically reproduced and distributed copyrighted materials in the classroom.
   f. Demonstrate the ability to appropriately cite the sources of electronically distributed information.
   g. Demonstrate awareness of best practices regarding computer and network security concerns (e.g., virus scanning, network log on) and shared resource management (e.g., bandwidth, storage space, mobile equipment).

1.4   Privacy, Security, and Safety Issues
   a. Demonstrate an understanding of how to use computer-based technology responsibly with regard to student, guardian, and school staff privacy and security (e.g., Children's Internet Protection Act of 2000).
   b. Demonstrate knowledge of various strategies for protecting students from inappropriate material and interactions in the classroom.
   c. Demonstrate knowledge of the legal requirement for obtaining proper consent in compliance with local policies for electronically producing, publishing, sharing, and distributing student, guardian, and school staff information (e.g., names, photographs, student work).
   d. Demonstrate an understanding of the safety issues related to the use of interactive communication tools (e.g., chat rooms, instant messaging, Webcams).
   e. Demonstrate an understanding of health issues related to the use of computers.

Domain 2.   Productivity Applications of Computer-Based Technology

2.1   Managing Records and Information
   a. Demonstrate awareness of data management and data analysis software.
   b. Demonstrate knowledge of spreadsheet and database applications and functions for collecting, sorting, and organizing data (e.g., grades, attendance, assessment records).

2.2   Communicating Through Multiple Forms of Media
   a. Identify and select appropriate application software to create, present, and/or publish a variety of documents (e.g., reports, tests, correspondence, newsletters that incorporate graphics and charts, Web pages).
   b. Demonstrate awareness of the process of creating and editing documents for a Web page.
   c. Demonstrate the ability to create a document utilizing a variety of media components that may include text, Web links, graphics, charts, sound, and video.

2.3   Communicating Using Computer-Based Collaborative Tools

   a. Demonstrate the ability to compose, send, forward, and reply to e-mail messages within and outside the school system.
   b. Demonstrate the ability to use an e-mail system's address book.
   c. Demonstrate the ability to use attachments.
   d. Demonstrate an understanding of ways to organize and archive e-mail messages.
   e. Demonstrate awareness of how to communicate in a variety of online collaborative environments, such as online bulletin boards, newsgroups, group e-mail lists, threaded discussions, online chats, and audio/video conferencing.
   f. Demonstrate an understanding of appropriate online and e-mail etiquette.

2.4   Using Electronic Research Tools and Applying Information Literacy Skills

   a. Demonstrate knowledge of state and national electronic reference sources/databases (e.g., California Learning Resources Network [CLRN], Educational Resources Information Clearinghouse [ERIC]).
   b. Demonstrate awareness of high-quality commercial reference and subscription information sources/databases.
   c. Demonstrate knowledge of methods for searching, accessing, selecting, and retrieving information using the Internet/intranet.
   d. Demonstrate the ability to download, store, and print information.
   e. Assess the authenticity, reliability, and quality of information resources.
   f. Assess the authenticity, reliability, and quality of data collected.
   g. Recognize biases based on gender, race, nationality, ethnicity, religion, age, disability, or cultural, economic, or geographic background.

Domain 3.   Teaching and Learning Applications of Computer-Based Technology

3.1   Using Current Best Practices and Research Findings on the Effective Use of Technology to Improve Teaching and Learning

   a. Demonstrate knowledge of how to analyze current research findings on effective uses of computer-based technology in teaching and learning.
   b. Demonstrate knowledge of how to design lessons based on the analysis of current best practices and research findings to improve student achievement.
   c. Demonstrate the ability to make data-driven decisions by using information gathered from multiple sources to guide instruction.
   d. Demonstrate knowledge of strategies for planning learning activities that include a variety of appropriate computer-based technology resources.
   e. Demonstrate knowledge of ways to develop and/or adapt lessons to utilize available technology resources (e.g., single vs. multiple computer instructional settings, static and mobile computer instructional settings).
   f. Demonstrate knowledge of strategies for managing computer-based technology activities along with other classroom activities.
   g. Demonstrate the ability to plan learning activities that include appropriate information literacy skills.
   h. Identify and use appropriate technologies for addressing a variety of student special needs and learning modalities.
   i. Demonstrate an understanding of methods for assessing student learning activities that integrate computer-based technologies.

3.2   Understanding Criteria for Evaluating and Selecting Software and Electronic Learning Media

    a. Demonstrate an understanding of established criteria for evaluating and selecting software and electronic learning media, including alignment with content standards; alignment with instructional strategy; appropriateness for students' reading and vocabulary levels; appropriateness for students' needs (e.g., differing learning modalities, special needs, language abilities); quality and quantity of useful information; relevance and clarity of objectives; logical development, organization, and flexibility; effectiveness of user interface; hardware and operating system requirements; district and school policy requirements; and the presence and effectiveness of built-in assessment tools.