

University of North Florida



***Active leaders and responsive partners
within diverse learning communities***

EME 6628: Educational Technology Systems

Candidate dispositions for the development and demonstration of ethical and professional attitudes and beliefs.

On-going, active reflection on professional practice.

Multiculturalism through educators who value diversity and advocate for the success of all students within diverse learning communities.

Professional growth of pre-service and experienced educators and other helping professionals.

Academic programs that are rigorous, standards-based, and model and apply innovative and enduring ideas about teaching and learning.

Scholarship for advancement of the professional knowledge base.

Service to the University, P-12 schools, the profession, and the community.

Syllabus

Course Number: EME 6628
Course Title: Educational Technology Systems
Number of Credit Hours: 3
Required or Elective: Required in Instructional Technology MEd

Term: Spring 2004
Day and Time: W, 7:30-10:15. Blended course: meets biweekly.
Location: 15/1105
Course web site: <http://blackboard.unf.edu>

Professor/Instructor: Dr. C. Cavanaugh
Office: 9/2249
Office Hours: T 2-4 PM, W 12-4 PM, or by appointment.
Telephone: 904-620-1751
Email Address: ccavanau@unf.edu
Instructor web site: <http://www.unf.edu/~ccavanau>

Required texts:

Upgrade and Repair Hardware and Operating Systems with Jean Andrews. Jean Andrews, July 2003. Premier Press (course.com). ISBN: 1592001122.
The School Network Handbook. EDC Center for Online Professional Education. ISTE, 2002. ISBN 1-56484-191-x.

Optional text:

We're Getting Wired, We're Going Mobile, What's Next?—Fresh Ideas for Educational Technology Planning. Bard Williams. ISTE, 2004. ISBN 1-56484-182-0.

Required Materials:

Blank floppy disks (PC format)
An Educator's Guide to School Networks, FCIT. Available online at <http://fcit.coedu.usf.edu/network/default.htm>

Course Description

The purpose of this course is to develop individuals who have an understanding of educational computer hardware and network systems that allows them to teach about technology systems concepts as well as to make decisions concerning their purchase, setup, repair and appropriate use. This course introduces students to networks in the school setting. Topics include technology management, components and configuration, connections, troubleshooting and maintenance. In this course, students increase their understanding of educational technology and network systems by learning to use a wide variety of technology systems.

In consonance with the conceptual framework, this course will be focused on the acquisition of knowledge and skills for designing and maintaining effective school technology infrastructure for PreK-12 grade levels.

Course Goals

In this course, teachers will develop and demonstrate dispositions of ethical and professional technology using educators as they learn skills and methods for budgeting, planning, deploying and maintaining appropriate technology tools and systems to enhance the instruction of all students. Teachers will use technology to reflect on their learning with technology.

Diversity Considerations

The course includes the topic of accessibility of technology for all students.

Technology Considerations

Instruction is enhanced using online resources and electronically delivered reading, presentations, and assignments. Teachers create assignments using a wide range of technology, including word processor, concept mapping software, presentation software, web page editors, scanners, digital cameras, and other means, and to submit assignments electronically. Teachers also participate in reflective discussion via online synchronous and asynchronous communication tools. Assignments will be completed using software versions located on the computers in 15/1105, including but not limited to: Windows XP, Microsoft Office 2002/XP, Internet Explorer, and Inspiration.

Course Objectives

Objective Matrix

Course Objective	Knowledge	Skill	Disposition	Impact
1.0 Configure technology systems and peripherals in educational settings.				
2.0 Recommend procedures for organization, management and security of technology systems.				
3.0 Evaluate, troubleshoot, install and maintain a variety of hardware and system configurations.				
4.0 Perform computer upgrades, such as the installation of storage devices.				
5.0 Use and manipulate network operating systems to manage the operation of a LAN.				
6.0 Describe issues related to selecting, installing and maintaining networks for schools.				
7.0 Document and assess experiences in implementing a network.				
8.0 Use budget planning and management procedures related to educational technology resources.				
9.0 Practice ethical, responsible, and legal use of technology systems and resources.				
10.0 Facilitate ethical, legal and human issues involving school purchasing and policy decisions related to educational technology systems.				

Please notify the instructor within the first week if a reasonable accommodation to a disability is needed for this course. A letter from the Student Disability Office must accompany this request.

Course Assignments, Expectations and Grading Procedures

GRADING PROCEDURES

Course grades are based on activities, projects, and assignments. Assignments may be turned in during class meetings in print or on disk, or they may be placed in Blackboard's assignment area or Digital Dropbox. Be sure to use the "Send" feature when sending files to the instructor's dropbox, and use the "Add" feature to put a backup copy of the file in your dropbox.

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1. Professional Conduct is necessary to earn an excellent or good grade.
2. School Technology Design and Budget (due week 14) 10
3. Class Activities and Participation 15
4. Technology Issue Web Page and Presentation (due week 16) 15
5. Quizzes (midterm and final) (weeks 8 & 15) 20
6. Technology Toolkit Project (due week 10) 15
7. School Technology Analysis (due week 5) 15
8. Hardware Cost-Benefit Analysis (due week 3) 10

All written work must be typed or word-processed, except for forms. All assignments have a 10% penalty per week for lateness, with no work accepted two weeks after the due date.

A	90-100	Excellent performance
B	80-89	Good performance
C	70-79	Fair performance
D	60-69	Poor performance

Assignment details and rubrics:

Professional conduct

Read assignments and engage in a positive way in all class discussions and activities. On-time attendance is required. Know and follow university policy regarding academic honesty. In your online work, follow standards of netiquette: be accountable for what you send, acknowledge online sources you reference.

School Technology Design and Budget 10 points

This assignment will be completed individually. Using a school floor plan, design and budget a school's technology resources and infrastructure. Using district equipment bid lists and manufacturer Web sites, develop and print a budget spreadsheet. Turn in your diagram and spreadsheet with a narrative summarizing your major decisions and rationale.

On time	Turned in on or before due date	Turned in within 1 week of due date	Turned in over 1 week after due date
2	2	1	0
Design	Diagram includes labeled servers, workstations, hubs, fiber switches	Diagram includes at least 3 of 4 elements labeled	Diagram includes 1 or 2 elements labeled
4	4	3	2
Budget	Budget total is within amount allocated, uses prices provided, and is submitted in spreadsheet form	Budget includes 2 of 3 elements	Budget includes only 1 element
4	4	3	2

Technology Issue Web Page and Presentation 15 points

Groups of two or three will share a computer presentation suitable for a school audience (students, teachers, parents) to educate them about a technology issue. The presentation method will be web pages. Groups and topics will be identified by midterm. Group work time will be provided when class schedules allow.

To see sample presentations from past classes visit: <http://www.coedu.usf.edu/techsupport>

Potential topics for presentations:

- Funding for school technology
- Getting started with the computer
- Do's and don'ts of school computing
- Basic computer troubleshooting
- Solving print problems, and getting better printouts
- Protecting your computer and data
- Everything you need to know about saving data
- Virus protection
- Connecting common devices: scanner, camera
- Creating a CD-ROM
- Using DVD
- Working with sound: speakers, headphones, microphones
- Simple ways to help your computer work better
- Preventive maintenance
- School technology plan development and components
- School network security
- School network troubleshooting

On time 2	Turned in on or before due date 2	Turned in within 1 week of due date 1	Turned in over 1 week after due date 0
Group 3	Group includes 1 – 3 members, each contributing significantly 3	Group includes 4 or more members, or all members do not make significant contribution 2	Group includes 4 or more members, and all members do not make significant contribution 1
Digital form 3	Presentation is delivered in digital form 3		Presentation uses non-digital delivery 0
School audience 3	Presentation is addressed at the level of a clearly indicated audience 3		Presentation is not addressed at the level of the indicated audience, or the audience is not indicated 0
Appropriate issue 4	The issue is directly related to school technology and is appropriate for the audience 4	The issue is unrelated to school technology or is not appropriate for the audience 2	The issue is unrelated to school technology and is not appropriate for the audience 0

Technology Toolkit Project

15 points

Each student or pair will create a short guide or form to assist a school technology coordinator. Choose a need or task commonly encountered by tech managers and users, and develop a checklist or form for the situation. Your toolkit item should be a text or RTF file, submitted in print and electronically in person, on disk, or using Blackboard. Grading rubric

To see sample projects from past classes visit: <http://www.coedu.usf.edu/techsupport>

Potential toolkit topics:

- Contact list for vendors and service people
- Network wiring diagram
- Inventory for hardware and software
- Procedures for beginning and ending the school year
- Computer problem-solving history
- Procedures for new users

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- Emergency checklist
- Back-up procedure

On time 2	Turned in on or before due date 2	Turned in within 1 week of due date 1	Turned in over 1 week after due date 0
Addresses need 7	Project addresses a legitimate and obvious need of school technology users/managers 7	Project addresses a need infrequently encountered or the need is unclear 3	Project addresses a need rarely encountered or the need is absent 0
Document 6	Document is usable, and is largely free of errors of language and fact 6	Document needs several revisions in language or content to be usable 4	Document needs substantial revisions or is unusable 2

School Technology Analysis

15 points

Select an area school to visit. Compare the school’s technology with the state average, and discuss the school’s strengths and needs. The analysis will be reported in a document. The report should include details on:

- A comparison of the school with the state and district averages, located at <http://www.doe.firn.edu/edtech/sr/trs/index.html>
- Technology strengths of the school. These may include hardware, network infrastructure, support, user ability, professional development or other factors.
- Identification of the main technology needs of the school, and concrete suggestions you would offer the school to help meet the needs.
- Summary of an interview with a school or district level technology representative about the status of the school.
- Your critique of the state Technology Resource Survey.

On time 2	Turned in on or before due date 2	Turned in within 1 week of due date 1	Turned in over 1 week after due date 0
School technology focus 5	Analysis includes detail about the technology strengths and needs of a school 5	Analysis includes some information about the technology strengths and needs of a school 3	Analysis includes information about technology strengths or needs of a schools 1
Information sources 5	Details are based a variety of sources, including site visit, interview, personal viewpoint and web 5	Details are based on few sources 3	Details are based on one source or personal viewpoint only 1
Critique of survey 3	Critique of survey is fair and balanced, and draws from outside sources to make points about effectiveness 3	Critique is unbalanced or draws on no outside sources 2	Critique is unbalanced and draws from no outside sources 1

Hardware Cost-Benefit Analysis 10 Points

Your scenario: a school has received technology funding to raise student achievement. You are the school's technology advisor in this project. Your job is to provide a report to the school your findings of a technology comparison. First decide on a student level, for example, primary age, intermediate grades, middle school, or high school. Next focus on a category of hardware, such as:

- Handheld computers
- Assistive technology devices
- Portable computers, such as laptops or tablets
- Word processing keyboards
- SmartBoard interactive display devices
- Others, including digital microscopes and videoconferencing systems

Select 3-5 of what you consider to be the best examples of products in the category for students at the age you have chosen. Develop a rubric for rating the products in the category for their suitability for student learning, and use the rubric to rate the products. Compare the relative costs, and the advantages and disadvantages of each product. Develop an educational rationale for using the funds for the product you rated highest, and propose a budget for the school.

On time 2	Turned in on or before due date 2	Turned in within 1 week of due date 1	Turned in over 1 week after due date 0
Learning need 3	Report includes information about the students and their need, ties the hardware decision to the need 3	Report includes reference to learning need, but lacks connection from hardware decision to need 2	Report lacks information about learning need 0
Rubric 3	Rubric analyzes hardware using a variety of factors related to the decision 3	Rubric analyzes hardware on the basis of three or fewer factors, or factors are unrelated to the decision 2	Rubric lacks comparative factors related to the decision 0
Hardware comparison 2	Each product in the category is discussed in terms of its merits and deficits related to the need 2	Some products are discussed, or discussion is not related to the need 1	Products are not discussed 0

Quizzes

The quizzes are short assessments of knowledge done using Blackboard twice during the semester.

Course Policies and Guidelines

COLLEGE OF EDUCATION AND HUMAN SERVICES POLICIES

1. Americans with Disabilities Act (ADA) Policy. The College of Education and Human Services complies with ADA requirements in making reasonable accommodations for qualified students with disabilities. Students desiring reasonable accommodations should contact the UNF Office of Disabled Services (Founders Hall 2120; telephone: 904/620-2769) and are encouraged to inform the instructor as early in the semester as possible regarding desired accommodations.

2. College Undergraduate Admission Policy. In order to earn credit toward an undergraduate degree in the College of Education and Human Services, students must be admitted to a COEHS undergraduate

program of study. Admission to the University does NOT in and of itself constitute admission to a given program of study. Transfer students cannot take more than 14 UNF hours toward any COEHS undergraduate degree without first having been fully admitted into a program of study.

Prior to being considered for full admission into an undergraduate program of study, students must (a) submit acceptable scores on all parts of the College-Level Academic Skills Test (CLAST) and (b) present official transcripts documenting a cumulative undergraduate GPA of 2.5 or better on a minimum of 60 semester hours from a regionally accredited college or university. Students are encouraged to consult the Undergraduate Catalog and/or contact the College's Office of Student Services (Schultz Hall 2305; telephone: 904/620-2530) for information regarding admission to a specific undergraduate program of study.

3. **University Enrollment Policy.** Only those students who are admitted to the University are entitled to enroll in classes, and only those students who are enrolled in a given course are permitted to attend class meetings for that course. Sitting through a class without registering does not constitute enrollment. Instructors are authorized to bar students who are not enrolled in a course from attending class sessions until evidence of enrollment is presented to the instructor. Even if unenrolled students are allowed via the instructor's oversight to remain in a class, university policy prohibits students from being added to a class roster after the reinstatement deadline. The primary responsibility for assuring that a student is enrolled in a course belongs to the student. Students are therefore encouraged to check their enrollment status several times during each semester with an advisor or via the UNF website.

4. **Policies Governing Student Conduct.** The University of North Florida has adopted a Student Conduct Code in order to promote responsible behavior for all students and to assure a physically, emotionally, and intellectually safe university community. This code addresses issues that may threaten the safety and order of the university environment and provides procedures and remedies for addressing these issues. Specific issues addressed include, but are not limited to, sexual misconduct; endangerment; harassment; hazing; possession/use of weapons, alcohol, and illegal drugs; damage or destruction of property; malicious mischief; computer misuse; and falsification/fraud. Students who are aware of and/or feel they are victims of any activity in violation of the Student Conduct Code should report the activity to the University Police or the appropriate campus administrator. The conduct code is available in its entirety on the University website at web address <http://www.unf.edu/studentaffairs/handbook/HB2002-2003.pdf>

5. **Academic Integrity Policy.** The University of North Florida has adopted a strict policy on academic integrity. As noted in the UNF 2003-2004 Undergraduate Catalog (p. 35) and the UNF 2001-2002 Student Handbook (p. 23), violations to academic integrity include, but are not limited to cheating; fabricating and falsifying information or citations; submitting the same work for credit in more than one course; plagiarizing; providing another student with access to one's own work to submit under this person's name or signature; destroying, stealing, or making inaccessible library or other academic resource material; and helping or attempting to help another person commit an act of academic dishonesty. The full policy on academic integrity is available on the University website at web address <http://www.unf.edu/studentaffairs/handbook/HB2002-2003.pdf>

The Academic Integrity Policy affords University instructors authority to assign penalties for these offenses. For example, the instructor may assign a grade of "F" on the assignment in question or for the course. In the case of flagrant violations of the Academic Integrity Policy, the instructor may recommend additional specific penalties to the university administration, including referral for academic counseling, expulsion from a program of study, denying of degree, expulsion from the University, or revocation of a degree already granted.

6. **E-mail Policy.** The University of North Florida's policy on student e-mail allows academic and service units of the University to use e-mail as the primary means for communicating certain types of information to students. Although individual instructors may determine that "external" (i.e., non-University-provided) e-mail accounts are a suitable means for communicating with students, the University policy specifies that the University-provided e-mail address serve as the "official" e-mail address for purposes of formal electronic communication with students. All students should become knowledgeable of their University-provided e-mail address and either check their account regularly or

arrange for all e-mail delivered to their account to be forwarded to an external e-mail account of their choice. Students can find out their e-mail account username, reset their password, and set forwarding options by visiting <http://www.unf.edu/compserv/guidelines/glemail.html>

INSTRUCTOR POLICIES

- Attendance: Attendance at each class meeting is required because of the practical, hands-on nature of instruction.
- Academic integrity: Follow the guidelines of the UNF Student Handbook located at <http://www.unf.edu/studentaffairs/mainpage.html>
- Assignment and quality of work: Completion of all assignments is expected during the week indicated. Assignments submitted after the due date are considered late, and a 10% reduction in grade will occur for each class day the assignment is late.

Schedule

Week	Topics	Activities	Readings & Assignments Due
1 1/7 Class	How computers work: hardware components and operating systems	Identify devices and components. Observing boot, BIOS, memory, hardware. Comparing OS. Diagnostics. Device Manager.	UR 1
2 1/14 Online	Hardware interactions with software. Operating systems.	Startup disk. Hardware settings. Begin <i>School Technology Analysis</i>.	UR 2, 15
3 1/21 Class	The system board: CPU, RAM, ROM, bus, expansion. Power.	Identify components. Safety practices. CMOS settings. Install cards. Hardware documentation, Help. Current specs. Power-saving features. Compare power equipment.	UR 3, 4 <i>Hardware Cost-Benefit Analysis</i>
4 1/28 Online	Ports and devices	Installing devices and drivers. Alternate input devices. Computer fact sheet. Current devices. Display settings.	UR 5, 8
5 2/4 Class	Storage: floppy drives, hard drives, and external drives	Format disk, system disk, copy disk, drive test. Replace and install drive. Compare drives. Optimize drive. Restore file. Utilities.	UR 7 <i>School technology analysis</i>
6 2/11 Online	Memory: ROM, RAM, Windows, upgrading and managing	Management utilities. Memory upgrade.	UR 4
7 2/18 Class	Multimedia	Install CD drive. Sound cards and settings. Digital cameras and video cameras.	UR 9
8 2/25 Online	Printers and portables	Compare printer. Compare laptops. Begin <i>Hardware Cost Benefit Analysis</i>	Quiz 1 (Chapters 1-9, 24) UR 12, 27
9 3/3 Online	Windows support	Windows keyboard shortcuts. Manage the desktop. Use the registry. Monitor performance.	Skim UR 16-23

10 3/10 Class	Networking basics	Install NIC and drivers. Set up peer-to-peer network. Observe wireless network.	UR 11; SN 1, 2. Educators Guide to School Networks. <i>Technology Toolkit Project</i>
3/17	<i>No class—spring break</i>		
11 3/24 Class	Networking continued	Observe network files. IP addresses. Observe network settings.	UR 25, 26; SN 3, 4.
12 3/31 Online	Troubleshooting basics	Software utilities. Virus detection. Troubleshooting flowcharts and scenarios. Control panel. Disassembly.	UR 13
13 4/7 Class	Purchasing and budgets	Purchase flowchart. Compare prices. School technology planning.	UR 14
14 4/14 Online	Management	School maintenance schedule. Be informed about new viruses. Exploring backup settings.	<i>School technology plan, design and budget</i>
15 4/21 Online	New technology	Compare handhelds. Study DVD-RW.	<i>Quiz 2 (Chapters 5-10, 18)</i>
16 Class	Presentations		<i>Technology Issue Web Page & Presentation</i>

Text key:UR=*Upgrade and Repair*, AndrewsSN=*School Network Handbook*, ISTE**Bibliography**

Duffy, T. & Jonassen, D. (Eds.). (1992). *Constructivism and the Technology of Instruction*. Hillsdale, NJ: Erlbaum.

Gagne, R. (1997). *The conditions of learning and theory of instruction*. New York: Holt, Rinehart and Winston.

Jonassen, D. (2000). *Computers as mindtools for schools*. Englewood Cliffs, NJ: Prentice Hall Publishers.

Ohler, J. (2001). *Future Courses: A Compendium of Thought About the Future of Technology and Learning*. Technos Press of the Agency for Instructional Technology.

Papert, S. 1996. *The connected family*. Atlanta, GA: Longstreet Press.

Thornburg, D. D. (1998). *Brainstorms and lightning bolts: Thinking skills for the 21st century*. San Carlos, CA: David D. Thornburg and Starsong Publications.

Websites

Educator Accomplished Practices (AP) <http://www.beaconlc.org/ctech/apwebsite/APpage.htm>

FL DOE <http://www.fldoe.org/>

US DOE <http://www.ed.gov/index.jsp>

FL FCAT <http://www.firn.edu/doe/sas/fcathome.htm>

Concept Mapping <http://www.mindtools.com/mindmaps.html>

Code of Ethics and Principles of Professional Conduct of the Education Profession in Florida
<http://www.firn.edu/doe/bin00061/publications/ethics.pdf>

Educator Accomplished Practices-Teachers of the 21st Century
<http://www.firn.edu/doe/bin00061/publications/12practices.pdf>

Subject Matter Content Standards for Florida Teachers
<http://www.firn.edu/doe/bin00061/publications/smcstandards.pdf>

Performance Standards for Teachers of English for Speakers of Other Languages
<http://www.firn.edu/doe/bin00011/perstand.htm>

Sunshine State Standards <http://www.firn.edu/doe/cgi-bin/doehome/menu.pl>

NCATE Unit Standards (National Council for Accreditation of Teacher Education)
http://www.ncate.org/2000/unit_stnds_2002.pdf

NCATE Program Standards: Elementary, Secondary <http://www.ncate.org/standard/programstds.htm>

NCATE Technology Standards
<http://www.ncate.org/standard/new%20program%20standards/iste%202001.pdf>

INTASC Standards (Interstate New Teacher Assessment and Support Consortium)
<http://www.ccsso.org/intascst.html>

Troubleshooting:

- Troubleshooting Resources <http://www.everythingcomputers.com/troubler.htm>
- Troubleshooting
<http://www.barnettcomputerservices.com/troubleshooting/troubleshooting.htm>

This course meets the following ISTE standards:

Educational Computing and Technology Facilitation (TF)

- TF-I. Technology Operations and Concepts. Educational technology facilitators demonstrate an in-depth understanding of technology operations and concepts. Educational technology facilitators:
- B. Demonstrate continual growth in technology knowledge and skills to stay abreast of current and emerging technologies.
 - 1. Model appropriate strategies essential to continued growth and development of the understanding of technology operations and concepts.
- TF-VI. Social, Ethical, Legal, and Human Issues. Educational technology facilitators understand the social, ethical, legal, and human issues surrounding the use of technology in P-12 schools and assist teachers in applying that understanding in their practice. Educational technology facilitators:
- D. Promote safe and healthy use of technology resources.
 - 1. Assist teachers in selecting and applying appropriate technology resources to promote safe and healthy use of technology.
- TF-VII. Procedures, Policies, Planning and Budgeting for Technology Environments. Educational technology facilitators promote the development and implementation of technology infrastructure, procedures, policies, plans, and budgets for P-12 schools. Educational technology facilitators:
- A. Use the school technology facilities and resources to implement classroom instruction.
 - 1. Use plans to configure software/computer/technology systems and related peripherals in laboratory, classroom cluster, and other appropriate instructional arrangements.
 - 2. Use local mass storage devices and media to store and retrieve information and resources.
 - 3. Discuss issues related to selecting, installing, and maintaining wide area networks (WAN) for school districts.
 - 5. Utilize methods of installation, maintenance, inventory, and management of software libraries.
 - 6. Use and apply strategies for troubleshooting and maintaining various hardware/software configurations found in school settings.
 - 7. Utilize network software packages used to operate a computer network system.
 - 8. Work with technology support personnel to maximize the use of technology resources by administrators, teachers, and students to improve student learning.
 - B. Follow procedures and guidelines used in planning and purchasing technology resources.
 - 2. Discuss and apply guidelines for budget planning and management procedures related to educational computing and technology facilities and resources.
 - 3. Discuss and apply procedures related to troubleshooting and preventive maintenance on technology infrastructure.
 - 4. Apply current information involving facilities planning issues and computer related technologies.
 - 5. Suggest policies and procedures concerning staging, scheduling, and security for managing computers/technology in a variety of school/laboratory/classroom settings.
 - 6. Use distance and online learning facilities.
 - 7. Describe and identify recommended specifications for purchasing technology systems in school settings.
- TF-VIII. Leadership and Vision. Educational technology facilitators will contribute to the shared vision for campus integration of technology and foster an environment and culture conducive to the realization of the vision. Educational technology facilitators:
- D. Lead in the development and evaluation of district technology planning and implementation.
 - 1. Participate in cooperative group processes and identify the processes that were effective.
 - 2. Conduct an evaluation of a school technology environment.
 - 7. Examine issues related to hardware and software acquisition and management.

Educational Computing and Technology Leadership (TL)

- TL-1. Technology Operations and Concepts. Educational technology leaders demonstrate an advanced understanding of technology operations and concepts. Educational technology leaders:
- A. Demonstrate knowledge, skills, and understanding of concepts related to technology (as described in the ISTE National Education Technology Standards for Teachers).
 - 1. Identify and evaluate components needed for the continual growth of knowledge, skills, and understanding of concepts related to technology.
- TL-II. Planning and Designing Learning Environments and Experiences. Educational Technology Leaders assist by planning, designing, and modeling effective learning environments and experiences supported by technology at the district/ state/ regional level. Educational Technology Leaders:

- D. Plan for the management of technology resources within the context of learning activities.
 - 1. Identify and evaluate options for the management of technology resources within the context of learning activities.
- TL-V. Productivity and Professional Practice. Educational technology leaders design, develop, evaluate and model products created using technology resources to improve and enhance their productivity and professional practice. Educational technology leaders:
 - C. Apply technology to increase productivity.
 - 8. Analyze and modify the features and preferences of major operating systems and/or productivity tool programs when developing products to solve problems encountered with their operation and/or to enhance their capability.
 - TL-VI. Social, Ethical, Legal, and Human Issues. Educational technology leaders understand the social, ethical, legal, and human issues surrounding the use of technology in PK-12 schools and develop programs facilitating application of that understanding in practice throughout their district/region/state. Educational technology leaders:
 - D. Promote safe and healthy use of technology resources.
 - 1. Communicate research and establish policies to promote safe and healthy use of technology.
 - E. Facilitate equitable access to technology resources for all students.
 - 1. Use research findings in establishing policy and implementation strategies to promote equitable access to technology resources for students and teachers.
 - TL-VII. Procedures, Policies, Planning, and Budgeting for Technology Environments. Educational technology leaders coordinate development and direct implementation of technology infrastructure procedures, policies, plans, and budgets for P-12 schools. Educational technology leaders:
 - A. Use the school technology facilities and resources to implement classroom instruction.
 - 1. Develop plans to configure software/computer/technology systems and related peripherals in laboratory, classroom cluster, and other appropriate instructional arrangements.
 - 2. Install local mass storage devices and media to store and retrieve information and resources.
 - 3. Prioritize issues related to selecting, installing, and maintaining wide area networks (WAN) for school districts, and facilitate integration of technology infrastructure with the WAN.
 - 4. Manage software used in classroom and administrative settings including productivity tools, information access/telecommunication tools, multimedia/hypermedia tools, school management tools, evaluation/portfolio tools, and computer-based instruction.
 - 5. Evaluate methods of installation, maintenance, inventory, and management of software libraries.
 - 6. Develop and disseminate strategies for troubleshooting and maintaining various hardware/software configurations found in school settings.
 - 7. Select network software packages used to operate a computer network system and/or local area network (LAN).
 - 8. Analyze needs for technology support personnel to manage school/district technology resources and maximize use by administrators, teachers, and students to improve student learning.
 - B. Follow procedures and guidelines used in planning and purchasing technology resources.
 - 1. Investigate purchasing strategies and procedures for acquiring administrative and instructional software for educational settings.
 - 2. Develop and utilize guidelines for budget planning and management procedures related to educational computing and technology facilities and resources.
 - 3. Develop and disseminate a system for analyzing and implementing procedures related to troubleshooting and preventive maintenance on technology infrastructure.
 - 4. Maintain and disseminate current information involving facilities planning issues and computer related technologies.
 - 5. Design and develop policies and procedures concerning staging, scheduling, and security for managing hardware, software, and related technologies in a variety of instructional and administrative school settings.
 - 6. Research and recommend systems and processes for implementation of distance and online learning facilities and infrastructure.
 - 7. Differentiate among specifications for purchasing technology systems in school settings.