

# CoSN's Framework of Essential Skills of the K-12 CTO



*The Framework of Essential Skills of the K-12 CTO* is comprised of three **primary professional categories** in the education technology field. Each of these categories includes **10 essential skill areas**, outlining the **responsibilities and knowledge** needed to be a viable **educational technology leader**. Each of these skills and the related knowledge needed to demonstrate them are included in CoSN's Certified Education Technology Leader (CETL) certification exam.

- Leadership & Vision
- Strategic Planning
- Ethics & Policies
- Instructional Focus & Professional Development
- Team Building & Staffing
- Stakeholder Focus
- Information Technology Management
- Communication Systems Management
- Business Management
- Data Management

The **Core Values & Skills** of the *Framework* extend through all 10 skill areas and are practiced by effective CTOs. They represent the critical personal skills and behaviors necessary for accomplishing all of the other competencies identified in the *Framework*. These core values and skills include being an effective **Communicator** and **Innovator**, **Exhibiting Courage**, and being **Flexible & Adaptable** and **Results-Oriented**.

## Primary Professional Categories

### I: Leadership & Vision

### II: Understanding the Educational Environment

### III: Managing Technology & Support Resources

# I. Leadership & Vision (40%)

## A. Leadership and Vision (15%)

Work closely with the executive team and stakeholders to develop a shared vision with long-term, big-picture perspectives on district goals to plan for meaningful and effective uses of technology; provide leadership when creating a vision of how technology will help meet district goals.

**IA** – Actively participate with members of the Superintendent's cabinet (e.g., district senior management) to create a vision for how technology will support the district's strategic and operational goals

**Knowledge of:** strategic planning techniques; effective collaboration skills; existing and emerging technologies; interpersonal communication skills (e.g., asking questions to solicit best ideas from the group and consensus-building strategies)

**IB** – Establish and lead advisory committees that inform and support meaningful and effective uses of technology in support of the district's strategic goals

**Knowledge of:** definitions of roles, responsibilities, and expectations; time management skills; organizational skills; constructive conflict management

**IC** – Facilitate the process of priority setting and decision making for meaningful and effective uses of technology in support of the district's strategic goals

**Knowledge of:** use of decision-making rules; time-management skills; organizational skills; big picture awareness; systemic planning skills

**ID** – Lead infusion of innovative technologies into all aspects of education

**Knowledge of:** scope of promising technologies; forecast of return on investment; benchmark measurements for key innovations

**IE** – Leverage appropriate relationships (opportunities) between emerging technology resources and the education process

**Knowledge of:** focus on effective, challenging, and engaging learning for all; value of new technologies

**IF** – Develop and maintain a systemic understanding of the core business and culture of the school organization

**Knowledge of:** listening skills; relationship-building skills; organizational structure (formal and informal); stakeholders (community and employee demographics); school district history

**IG** – Employ technology within the interdependent environment of assessment, curriculum, and instruction

**Knowledge of:** sources and nature of educational content and processes; technologies that can be used for the greatest impact on teaching and learning; assessment best practices (e.g., how to assess key instructional activities, learning diagnostics, assessing learning styles, educational terminology, and accommodations for all learning styles)

**IH** – Facilitate change in an organization and deal with ambiguity effectively

**Knowledge of:** techniques to manage the change process; cultural context of change; role of professional development in change process; techniques for communicating need for change, direction, and destination (successful accomplishment of vision); facilitating change

**II** – Promote effective use of communication and marketing resources

**Knowledge of:** building support for change through a variety of mechanisms (leading by example, and personal and mass communication); relationship building; marketing collateral (online, hardcopy); public speaking; use of data to help people to draw conclusions; storytelling (e.g., tangible examples of what effective change looks like)

**IJ** – Collaborate with business and instructional units to develop ownership of their work processes

**Knowledge of:** effective power-sharing techniques; building supportive relationships; importance of focus on shared goals; value of using processes (methods) that recognize contributions of individual stakeholders; sense of common mission; camaraderie to ensure success

**IK** – Communicate the effectiveness of technology in professional activities (e.g., model, inform, and demonstrate how technology assists with productivity)

**Knowledge of:** role of technology to enhance efficiency and effectiveness of current practices; cost reduction opportunities (e.g., online attendance, accounting, CNP, operations, and professional development records for certification documentation)

## **B. Strategic Planning (15%)**

Have a high-level view across the school system and work with instructional and technical teams to identify steps needed to transform the technology vision into a long-range plan, complete with specific goals, objectives, and action plans.

**2A** – Work with key system leaders, people networks and/or learning communities (e.g., math teachers) and departments to identify steps needed to meet strategic goals

**Knowledge of:** identifying system leaders; best practice of strategic planning; technology framework; alignment of technology to the strategic goals

**2B** – Work with key system leaders, people networks (e.g., math teachers), and departments to identify budget and funding mechanisms needed to meet strategic goals

**Knowledge of:** sources of funds, including federal, state, local, and public and private grants; donations; budget development (chart of accounts)

**2C** – Align technology team activities with the school district goals

**Knowledge of:** aligning resources such as people, capital, and expenses; goals and performance evaluations aligned to district goals; relative priorities of competing demands

**2D** – Promote and lead the implementation of industry best practice methodologies, tools, and programs (e.g., TCO, ITIL, SDLC, Baldrige) in support of technology

**Knowledge of:** TCO concepts; modeling the implementation of methodologies, tools, and programs in support of district goals; use of financial information, financial, and non-financial metrics; conducting a needs assessment

**2E** – Articulate and fully leverage the value of investment (VOI) in technology to ensure effective delivery of services aligned to the district vision and goals

**Knowledge of:** communicating the alignment of research to support best practices to illustrate VOI; application of project management; prioritization concepts to implementation

**2F** – Provide leadership in strategic alignment of technology with all district systems (e.g., instruction, assessment, finance, facilities, transportation, security, food service)

**Knowledge of:** how to find evidence and examples of successful solutions for each district system and department; methods of identifying “all district systems;” methods of communicating results (e.g., case study); district system components

**2G** – Integrate technology with curriculum and instruction to provide an appropriate teaching and learning environment

**Knowledge of:** evidence and examples of successful solutions for each district system and department; measurements for how technology supports each system or department; integration and relationships between various departments

**2H** – Develop sound practices that guide, articulate, and inform the organization of risk management strategies and risk mitigation in support of business and instructional initiatives

**Knowledge of:** developing a security plan; periodic and ongoing tests for backup and recovery; redundancy systems; means of assessing risk and potential impact

**2I** – Monitor, evaluate, and report on district’s educational technology plan

**Knowledge of:** metrics; data on goals, strategies, and budget to support the technology plan; reports that are meaningful to stakeholders (applicable to education)

**2J** – Advocate for district-wide disaster recovery and business continuity planning

**Knowledge of:** best practice examples of successes and failures; a phased-in plan to include multiple solutions; involving stakeholders in refining plan; implementing drills

**2K** – Plan and implement the district’s goals and objectives by leading innovation and strategy

**Knowledge of:** conveying complex technology concepts in familiar terms to non-technology staff; translating data and statistics into easily understood graphical representations of goals and objectives; engineering solutions based on existing goals and objectives; developing solutions for creating a process of continuous improvement

### **C. Ethics and Policies (10%)**

Manage the creation, implementation, and enforcement of policies and educational programs relating to the social, legal, and ethical issues related to technology use throughout the district and modeling responsible decision-making.

**3A** – Model and ensure adherence to state and federal laws

**Knowledge of:** applicable state and federal laws; monitoring for compliance; collaborating with other impacted departments and areas of district; system goals and practices; process for demonstrating personal and system compliance

**3B** – Demonstrate high standards of integrity and professional conduct with consideration for fairness and honesty

**Knowledge of:** policies and procedures at all levels (e.g., district, federal, E-Rate); maintaining records

**3C** – Communicate to stakeholders the appropriate ethical and professional behavior for technology use in the district

**Knowledge of:** examples of best practices; expert examples in the field and/or experts who can share their examples

**3D** – Model and ensure awareness about pertinent laws and legal issues related to implementation and use of technology in a district (e.g., copyright, privacy, and compliance)

**Knowledge of:** resources for maintaining current information about laws and legal issues and how particular district departments, policies, and practices are impacted; multiple methods of communicating information

**3E** – Maintain safety of students and staff

**Knowledge of:** potential vulnerabilities and issues; best preventive practices; cyber-security and physical security; policies impacting vulnerabilities

**3F** – Demonstrate commitment to responsible environmental protection and energy-saving practices

**Knowledge of:** how to align technology planning and implementation to support goals for environmental protection and energy-saving practices; best practices for appropriate equipment disposal

**3G** – Collaborate with others in the policy development process by ensuring that policies support a high-performing learning environment

**Knowledge of:** existing policies with impact on high-performing learning environments, policy development guidelines and process; policy writing and development; communicating and collaborating with individuals; the definition of a high-performing learning environment

**3H** – Facilitate equitable access to technology resources for all stakeholders

**Knowledge of:** definition of equitable access; structuring technology expenditure formulas to accommodate equity; identifying stakeholders in the equitable process, as determined by district practice and/or policies; access needs of diverse students and staff (e.g., UDL information, IDEA, ESL, special needs)

## II. Understanding the Educational Environment (30%)

### A. Instructional Focus and Professional Development (12%)

Budget, plan, and coordinate ongoing, purposeful professional development for all staff using technologies; ensure a sufficient budget through the implementation and assessment process of emerging technologies.

#### 4A – Plan for and coordinate ongoing, purposeful professional development

**Knowledge of:** needs assessments; resources (funding, technologies, and policies); stakeholder feedback; communications

#### 4B – Identify and promote how technology can support educational best practices through communication and collaboration with the district instructional leadership

**Knowledge of:** needs assessment with instructional leaders; best practices (from research and collaboration with field); alignment of technology resources to support best practices; alignment of technology and curriculum standards

#### 4C – Empower staff to reach a proficient level to meet the ongoing demands of their jobs

**Knowledge of:** staff proficiency assessment; alignment of job roles to technology resources; resource availability or need

#### 4D – Promote standards for innovative teaching and learning that develop student proficiency in 21st century skills

**Knowledge of:** communicating 21<sup>st</sup> century skills; plan to share or communicate examples of standards and innovative teaching; collaboration with local education institutions to establish programs of interest for existing teachers; how to serve in an advisory capacity to develop new teachers

#### 4E – Stay abreast of state and national standards, benchmarks, and frameworks for technology literacy

**Knowledge of:** organizations responsible for developing and modifying standards; collaborating with staff to share updates regarding standards; professional development associated with the standards

#### 4F – Promote the application of technology to address the diverse needs of students and maximize student learning

**Knowledge of:** stakeholder needs; identification of resources; plan to share and/or facilitate professional development opportunities; examples of effective uses of technology to maximize learning for diverse students

## B. Team Building and Staffing (9%)

Play an integral role in the district's strategic planning process; create and support cross-functional teams for decision-making, technology support, professional development, and other aspects of the district's technology program.

**5A** – Create cross-functional teams for appropriate aspects of the district's technology program

**Knowledge of:** district's organization; when to pull people together, who to pull together, and how to pull them together; roles and responsibilities within the district; who should be around the table; protocols; determining when a team is necessary; when and how to come to consensus

**5B** – Support cross-functional teams for appropriate aspects of the district's technology program

**Knowledge of:** the team's function; ensuring the resources to deliver on the functions (e.g., knowledge, funding, time, tools)

**5C** – Manage diverse, cross-functional teams that work and perform well

**Knowledge of:** distributed leadership; leadership skills

**5D** – Mentor and empower others to assume leadership roles; set clear objectives and measures; monitor process, progress, and results

**Knowledge of:** defining and setting expectations; establishment of agendas and targets; planning and coordinating meetings; meeting protocols; feedback; assigning defined responsibilities to others (e.g., delegation)

**5E** – Build an environment of trust through communication and transparency about decisions and how they are made

**Knowledge of:** purpose of any team; ensuring everyone is clear on the expectations of the team and their roles on the team; standards for team communications (who, what, when, where, how); proper follow-through on team commitments

**5F** – Use tools (e.g., quality improvement) for decision making to support effective teamwork

**Knowledge of:** team milestones; how and who to meet the milestones; framework for decision making that includes current state and desired state assessment information; scorecards, dashboards, and/or progress summary

**5G** – Build an environment that encourages team member communication

**Knowledge of:** engaging team members; communication protocols (reply to all or send to lead person, shared tool set); limiting positional power; ensuring everyone has the opportunity for input; issues associated with favorites; appropriate use of meetings; post-meeting follow-up that includes everyone

**5H** – Analyze and identify on an ongoing basis individual and team strengths, required areas of growth, and how teams and their members are being deployed and redeployed

**Knowledge of:** building teams based on the needs of the team and not the job; descriptions of individual strengths and weaknesses of the staff; separating fact from opinion; reconciliation of mixed messages; techniques for dealing with personalities and professional interactions

**5I** – Make effective hiring decisions using quantitative and qualitative data

**Knowledge of:** representative job descriptions; screening and interviewing processes that match the knowledge, skills, and dispositions necessary for success in the job; valid measures; measures that are appropriate for the position and the environment; validation of information sources

**5J** – Provide feedback to individuals and teams on a regular basis regarding areas of strength and required growth, using quantitative and qualitative data

**Knowledge of:** establishing team benchmarks; providing on-going feedback to the team; when to address the individual one on one and when to escalate to a supervisor; characteristics of feedback (e.g., timely, specific, corrective)

**5K** – Analyze the structure and organizational chart of the team relative to its ability to address the district strategic plan

**Knowledge of:** team function and responsibilities; clear job descriptions; accuracy and publication of organizational chart; involving board and cabinet as needed; assessing strategic plan for staffing requirements; needs analysis; alignment of staffing resources to needs; skills development

**5L** – Deploy staff to best address the district strategic plan and meet its goals

**Knowledge of:** realigning positions and reassigning staff based on data obtained from organization structure; working through HR and the budget process as necessary

### **C. Stakeholder Focus (9%)**

Build relationships with all stakeholders, taking a close look at how the district determines requirements, expectations, and preferences. Understand the key factors that lead to stakeholder satisfaction, focusing on how the district seeks knowledge, satisfaction, and loyalty of students and other stakeholders.

**6A** – Build buy-in for the vision for the district's technology program

**Knowledge of:** identifying stakeholder groups; structuring focus groups of representative stakeholders; importance of educating stakeholder groups; alignment of district goals with stakeholder goals

**6B** – Build relationships with stakeholders

**Knowledge of:** anticipating and then clarifying technology needs and/or interests for each group of stakeholders; positives and/or negatives for the stakeholder group and how to address each; communication models for listening and interpersonal skills; human metrics and methods of implementing successful human interactions

**6C** – Collaborate with stakeholders to create a vision for how technology will support the district’s strategic goals

**Knowledge of:** ensuring stakeholders know the district vision and strategic goals; solicit input and/or feedback from stakeholders for vision for technology; electronic collaboration tools that assist in stakeholder involvement

**6D** – Build and leverage effective partnerships with organizations that benefit district stakeholders

**Knowledge of:** building partnerships that can yield funding via grants or charitable contributions; identifying appropriate technology options to support volunteer and/or alternative efforts to improve education (e.g., enable network access outside traditional school hours); models for identifying opportunities and their requirements for supplementing district resources

**6E** – Effectively communicate using emerging technologies to reach stakeholders

**Knowledge of:** using newly emerged technologies to communicate with stakeholders (e.g., current tools like Twitter, Facebook, messaging systems); how each stakeholder selects preferred method(s) of communication

**6F** – Assess and respond to needs and concerns of all knowledge workers and stakeholders

**Knowledge of:** definition of “knowledge workers;” designing a means to gather and respond to needs and/or concerns of stakeholders; concepts behind survey development; synthesizing and aligning stakeholder needs; concerns with district goals and objectives

# III. Managing Technology and Support Resources (30%)

## A. Information Technology (9%)

Direct, coordinate, and ensure implementation of all tasks related to technical, infrastructure, standards, and integration of technology into every facet of district operations.

**7A** – Plan all tasks related to technical systems, network infrastructure, and technology device management

**Knowledge of:** system design; standards concepts (e.g., networking standards and interoperability); resources available (e.g., funding and people); rationale for technology choices made; need for training, readiness, and concept of scalability

**7B** – Implement all tasks related to technical systems, network infrastructure, and technology device management

**Knowledge of:** techniques for overseeing the implementation; alignment of roles and responsibilities to tasks and project management techniques

**7C** – Sustain all tasks related to technical systems, network infrastructure, and technology device management

**Knowledge of:** impact of choices made (e.g., if outsourced, still have to sustain); keeping up with availability and trends of emerging technology

**7D** – Evaluate all tasks related to technical systems, network infrastructure, and technology device management

**Knowledge of:** total cost of ownership; return on investment; pilot projects (e.g., meet goals, support education, comparison of plans to actual outcomes); communication with stakeholders; development of evaluation instruments

**7E** – Assess all tasks related to technical systems, network infrastructure, and technology device management

**Knowledge of:** application of results of evaluation and making the appropriate changes

**7F** – Direct, coordinate, and ensure implementation of all tasks related to the integration of technology into every facet of operations

**Knowledge of:** the meaning of integration in the education environment; which systems support which types of operations (e.g., purchasing systems related to cafeteria); how filtering has an impact on operations

**7G** – Develop, collect, interpret, and report metrics for all aspects of the IT system

**Knowledge of:** utilization, uptime statistics, and equity (e.g., number of devices); staff efficiency; ratios of technicians to students or devices; mean-time-to-repair (MTTR); who the users are and how the system was being used (students versus staff); how metrics are used by stakeholders

**7H** – Develop and implement disaster recovery and business continuity plans that are an integral part of the district’s technology program

**Knowledge of:** difference between disaster recovery and business continuity as well as best practices of both; resources that are “mission critical;” levels of risk; managing expectations

## **B. Communication Systems (7%)**

Use technology to improve communication, directing and coordinating the use of e-mail, district websites, web tools, voice mail systems, and other forms of communication to facilitate decision-making and to enhance effective communication with key stakeholders.

**8A** – Direct and coordinate use of e-mail, district websites, web tools, voice systems, and other forms of communication

**Knowledge of:** which systems are in use and if they are interoperable with each other as well as how scalable they are; which stakeholders are accessing systems; how stakeholders are accessing systems; which emerging access options and devices are available; how to collaborate with stakeholders in the field about what is effective; how to maintain connections and/or collaboration with stakeholders in the field

**8B** – Use various communication tools and techniques

**Knowledge of:** emerging communication tools and their potential use within the education environment; building relationships with experts for recommendations and information on interoperability; information on what other districts are doing

**8C** – Accommodate technical issues related to implementation of various communication tools

**Knowledge of:** feedback from stakeholders on issues and needs; communicating with experts; currently installed systems; determination of interoperability issues or needs

**8D** – Resolve design, accessibility, and compliance issues related to keeping district, school, and teacher websites and other communication tools updated and operational

**Knowledge of:** organizational policies (e.g., acceptable use policy for students and employees, student information, copyrights, ethical use of district resources and internet); collaborating with experts and stakeholders to establish standard framework for content and security

**8E** – Enhance communication by keeping up to date on emerging technologies

**Knowledge of:** emerging communication tools and their potential use within the education environment; organizations responsible for sharing emerging technologies that enhance communications; conferring with experts in the communications field on standards and interoperability

**8F** – Maintain communication systems by ensuring that they are updated, compliant, and operational

**Knowledge of:** internal support capabilities; research on other support options; uptime requirements and the relationship to support; available resources; necessary compliancy requirements (e.g., archiving, use and abuse, security, and records retention)

### **C. Business Management (7%)**

Manage the budget and serve as a strong business leader who guides purchasing decisions, determines the return on investment for all technology implementations, and fosters good relationships with vendors, potential funders, and other key groups.

**9A** – Identify funding sources available to the district and leverage them to meet district and programmatic goals

**Knowledge of:** differences between recurring sources and one-time funding; differences between capital and operational expenses and funding; matching funding; federal guidelines (e.g., Title I), E-Rate certifications and guidelines, grants, state funds

**9B** – Develop and manage budgets, both annually and long-range

**Knowledge of:** differences between leasing and purchasing; differences between fixed expenses and variable expenses; salary administration; differences between unit costs and extended costs; differences between budgeted costs and actual costs; budget cycle; fiscal year

**9C** – Develop accurate pricing estimates for technology initiatives by using TCO and VOI

**Knowledge of:** differences between TCO and VOI (soft and hard benefits); principles of TCO and VOI; tradeoffs

**9D** – Make effective purchasing decisions following relevant laws, policies, and guidelines

**Knowledge of:** bid and RFP processes; bulk purchasing, warehousing, just-in-time purchasing; aligning purchases to goals and needs; laws and monetary limits; quotes; contracts and contract negotiations; impact of inventory and insurance practices on purchasing decisions; asset management life cycle

**9E** – Manage district funds by following basic financial and accounting principles and processes and all regulatory guidelines

**Knowledge of:** differences between line item budgeting and categorical budgeting; financial reporting and forecasting; budget rollover or carryover; role of governing bodies in (re)appropriations of funds

**9F** – Direct, manage, and negotiate with vendors and business partners

**Knowledge of:** district and state policies and guidelines (e.g., monetary limits, lunch and other benefits, legal requirements, purchasing guidelines); volume purchasing; discounts; differences between leasing and purchasing and/or multi-year purchasing; ethical purchasing; task forces to bring in business partners; collaborating with business partners; in-kind contributions and donations; contacts with vendors that are appropriate; rules for negotiation; vendor performance management; process for a non-performing vendor

**9G** – Direct, coordinate, and ensure implementation of all tasks related to selection and purchasing (e.g., RFPs, purchasing guidelines)

**Knowledge of:** preparation of RFPs; milestones for contract payments based on implementation

**9H** – Budget for ongoing, purposeful professional development for all staff using new technologies

**Knowledge of:** budgeting and implementing of professional development; analyzing in-house services against contracted services; analyzing the scope of necessary training

## **D. Data Management (7%)**

Manage the establishment and maintenance of systems and tools for gathering, mining, integrating, and reporting data in usable and meaningful ways to produce an information culture in which data management is critical to strategic planning.

**10A** – Establish systems and tools for gathering, warehousing, mining, integrating, and reporting data in usable and meaningful ways

**Knowledge of:** basic understanding of database structures and concepts (enter once/use many); effects of invalid data; authorizations and security standards; data streams and systems; platforms and interoperability; data frameworks and multi-dimensional data cubes as well as scalability; evaluating and managing user needs; requirements gathering

**I0B** – Maintain systems and tools for gathering, warehousing, mining, integrating, and reporting data in usable and meaningful ways

**Knowledge of:** data migrations; data loss management; monitoring health of data systems through reporting; understanding differences between web-based computing and cloud computing as well as differences between hosted and self-hosting

**I0C** – Make decisions based on data and related processes in support of stakeholders

**Knowledge of:** availability of on-demand data; needs assessment and/or gap analysis; automation of data capture; access to the right data for the right people

**I0D** – Administer data and databases following industry standards, (e.g., SIF and SCORM)

**Knowledge of:** definition, description, and differentiation between SIF and SCORM

**I0E** – Assess and respond to information reporting requirements related to government mandates

**Knowledge of:** alignment of input to output; collection of data needed to produce necessary reports; data validation processes; data needs of end-users

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