FCMAT
FISCAL CRISIS & MANAGEMENT ASSISTANCE TEAM
CSIS California School Information Services

October 27, 2016

Matthew Duffy, Superintendent
West Contra Costa Unified School District
1108 Bissell Ave.
Richmond, CA 94801-3135

Dear Superintendent Duffy,

The purpose of this management letter is to present the findings and recommendations of the Fiscal Crisis and Management Assistance Team (FCMAT) resulting from the recent technology staffing review. As indicated in the study agreement, dated November 17, 2015, FCMAT reviewed the staffing of the district's Technology Department and the duties and responsibilities of other staff in the district who provide technology support.

The study agreement states that FCMAT will perform the following:

1. Conduct a three-day on-site visit to review the district's Information Technology Department staffing as well as any other staff in the district that provide technology support. Subsequent to the on-site review, the team will provide the district with a management letter containing recommendations for current and future staffing. The team will review the district's organizational chart, job descriptions and technology master plan, interview staff, and analyze any other documents needed to assess the district's technology staffing needs.

FCMAT conducted fieldwork at the district office on May 3-5, 2016, and additional off-site work during the weeks that followed. FCMAT reviewed numerous documents including job descriptions, technology plans

Overview of Technology Staffing

The district's technology is supported by 33 positions in the Information Technology Department, which is led by a chief technology officer who reports to the superintendent.

Leadership, Administration, and Data Support

Chief Technology Officer

The chief technology officer (CTO) is the senior leader for all strategic and operational functions of the Information Technology Department. Responsibilities include advising the superintendent on technology-related matters, directing and implementing the district's vision for technology use, supervising and evaluating staff, and planning for the district's short- and long-term technology needs. The position reports directly to the superintendent and is a member of the superintendent's cabinet.

As the senior technology leader, the CTO is responsible for the implementation of all technology-based initiatives and programs. However, the district's organizational and operational structure makes other individuals responsible for selecting certain technology systems and software. For example, the chief business official is responsible for selecting and implementing the financial system, which must exchange data with other district-operated systems. A similar situation exists with the district's student data.

The Information Technology Department is directly responsible for the student information system, California Longitudinal Pupil Achievement Data System (CALPADS) and California Basic Educational Data System (CBEDS) reporting, and student attendance reporting. A recently created position of chief data officer in the Educational Services Department is responsible for ensuring the integration of technology and data from all information systems, according to the job description. In addition, the job description for the director, systems integration position states that its main functions include, "assumes lead role in the analysis on enterprise data resident in the district's information systems." Having multiple positions responsible for the same tasks as part of their main functions can lead to confusion regarding roles and responsibilities.

As stated in the job description, the CTO is responsible for planning and implementing a program that uses information technology effectively and efficiently in an integrated manner for both instructional and administrative functions. For instruction, the job description states that the CTO "develops, implements, or introduces technology-based instructional programs that support the WCCUSD academic programs . . ." Interviews with staff revealed confusion regarding who sets the vision for instructional technology use, which has resulted in the lack of a single comprehensive vision for learning technologies. Although FCMAT found widespread agreement on a plan for each student to have an assigned device during instructional time, there was not a common understanding of what the 1-to-1 initiative means or how it will be implemented.

There was consensus among employees that staff in the technology department are dedicated, responsive, and do everything they can to provide timely and effective support. Interviews with staff located at school sites and departments indicated a need for additional staffing to meet the current and increasing demands the 1-to-1 initiative has placed on the technicians and their ability to resolve trouble tickets with minimal disruption to instruction.

The district's 1-to-1 initiative is an example of how technology has transitioned from an operational function serving administrative and business purposes to a strategic component that is required to fulfill every aspect of the district's mission. During FCMAT's fieldwork, a suggestion was made by the district to change the reporting structure for the chief technology officer from reporting directly to the superintendent to reporting to the associate superintendent of operations; however, such a change would be ill-advised because it does not take into account the strategic impact of all aspects of technology and how an operational decision in one area might have unintended consequences throughout the system, including for curriculum and instruction, pedagogical approaches, learning outcomes, and student achievement.

Districts in which the chief technology officer reports directly to the superintendent allow the CTO to work as a strategic partner and colleague with other cabinet-level positions to ensure that the right technology is selected, implemented, and supported so that all aspects of the district's mission are met. In districts with highly effective technology programs, the CTO works closely with each cabinet member and provides direct oversight and support for all technology systems. In the West Contra Costa Unified School District, each assistant superintendent is responsible for technology decisions for their area of supervision. Although most technology decisions are made after consulting with the CTO, this is not always the case. To align its functions and organizational structure with the CTO job description and

scope of responsibilities, the district should keep its current reporting structure for the CTO position and establish processes to ensure that the CTO is a key decision maker in collaboration with each assistant superintendent for all technology purchasing, implementation, and support.

Data governance is another main responsibility of the CTO. The district has created a chief data officer (CDO) position. Although the responsibilities of the CDO focus mainly on the reporting and use of student achievement data, which is outside the scope of responsibility of the CTO, the overlap of some responsibilities has caused confusion and requires clarification. To avoid conflicts, clarity regarding roles is essential for every position in the district, including cabinet positions. The district will need to review the CTO and CDO positions' job descriptions to clarify responsibilities and ensure that roles are well defined and understood.

Districts that have a clear, compelling, and well-communicated vision for technology are better able to gain support from all levels of the organization and focus efforts toward stated goals. The district's staff understand that the 1-to-1 computing initiative is a priority but lack a clear understanding of the end result of the initiative; this has allowed skepticism and resulted in insufficient support for successful implementation.

Recommendations

The district should:

1. Continue the current reporting structure, with the CTO reporting directly to the superintendent.
2. Ensure that the CTO and the assistant superintendent of educational services jointly clarify and communicate a unified vision for technology's role in student learning.
3. Review and clarify the roles and responsibilities of the CTO, the director of systems integration, and the chief data officer.
4. Ensure that the CTO develops a transition plan to assume responsibility for oversight and support of all technology systems.

Director, Systems Integration

The director, systems integration oversees four supervisory positions and seven additional staff who provide a variety of functions, from ensuring that disparate data systems share data to maintaining the integrity of data in the student information system. Staff rely on these systems for CALPADS, CBEDS, and attendance reporting. These are critical systems and reports because they provide the data used to determine the district's funding.

The responsibilities for this position have increased over the past few years and now exceed what is indicated by the position's title. For example, the position is responsible for planning for and resolving threats and other issues that affect data integrity, and advises other department leaders on various data reporting and analysis processes. The job description's primary function section states that the position "… assumes lead role in the analysis of enterprise data resident in the district's information systems; works with various internal business groups resolving data related issues..." However, the position is actually primarily responsible for managing a staff that provides state reporting, data integration, and support for the student information system. These responsibilities are greater than those outlined in the job description.

Positions that report directly to the director, systems integration provide state data reporting functions, database administration, and student data system administration and support. A supervisory position focused on programming for data integration among disparate data systems also reports to the director, systems integration. A more suitable position title that is aligned with similar responsibilities in other school districts is director, information services.

Recommendations

The district should:

1. Change the title of the director, systems integration position to more closely match the responsibilities and oversight of the position. Director, information services is a common title.

Student Information System Supervisor

The student information system supervisor supervises a typist clerk 2 position that is currently vacant, an attendance enrollment technician, and three data entry clerks. The student information system supervisor is charged with administering the student information system, training users of the system, and overseeing the integrity of the data in the system. The position is also responsible for providing the data required for various reports and creating queries to generate custom reports for school and central office administrators.

Data Entry Clerks

The major function of the three data entry clerks is to collect paper enrollment forms from school sites and enter the data into the student information system. They also help train staff to use the student information system, Power School, and often act as the first level of support for school staff using the system.

The district's kindergarten registration process is labor-intensive. Parents complete multiple forms for each child, often providing the same information more than once. Collecting paper forms for all transitional kindergarten and kindergarten students requires school staff to review each form in the packet for completeness and legibility and then transfer the paper documents to the data entry clerks for entry into Power School. Transferring data from paper forms into Power School is also labor intensive and increases the chance of error.

Many school districts similar in size to West Contra Costa Unified School District have implemented an online student registration system. Parents who do not have Internet access at home are invited to use a kiosk or lab computers at their local school during designated hours. Districts that have implemented online registration have reduced data entry errors, streamlined the registration process, and reduced the need for parents to provide duplicate information.

Typist Clerk 2

The typist clerk 2 position has been vacant for several months. Employees indicated that the typist clerk 2 functioned as a receptionist in addition to providing clerical support. The district's technology support center is a secure facility that requires a visitor to be granted access after someone inside the building visually identifies the visitor. Although the facility does not have a constant flow of visitor traffic as does the district's main administration building, the reception desk needs to be staffed at some level. During fieldwork, FCMAT observed data entry clerks performing this task; this appears to be a satisfactory solution.

Recommendations

The district should:

1. Implement an online student registration system.
2. Eliminate the typist clerk 2 position.

Data Integration Analyst

The data integration analyst position uses the job description of the data warehouse analyst position. The district does not have a data warehouse. The data integration analyst provides highly technical services by writing custom programming to facilitate the automated exchange of data among different software systems. For example, many instructional software programs, such as Illuminate, Destiny, Renaissance Learning, Onelogin, and Read 180, require data from the student information system. Programs like Onelogin also require data from other programs to facilitate single sign-on capabilities.

Local educational agencies that have a data warehouse rely on the same programming skills that the district's data integration analyst provides. However, the job description for the data warehouse analyst position does not accurately match the skills and functions required of the data integration analyst position. The district does not have a job description that accurately describes the programming skills the data integration analyst position requires.

Recommendations

The district should:

1. Develop a job description that accurately describes the skills required for the data integration analyst position.
2. Give the data integration analyst position a title that aligns with the new job description. Programmer is a more accurate title for the position.

Data Services Team

The effective use and governance of data is a key component and indicator of a school district's success in fulfilling its core mission. School districts that have rapidly improved student achievement attribute the success in large part to using data to inform instruction. Although this often brings to mind assessment data, school districts have found that using attendance data, discipline data, and information gathered from observation of and discussion about best practices (also known as instructional rounds), student portfolios and other qualitative data helps school teams ask better questions regarding their practices and identify effective practices that might be replicated. District-level data teams can be vital to a district's mission by quickly gathering data needed to make informed decisions.

Attendance Enrollment Technicians

The district has three attendance enrollment technicians; two of these positions report to the state reporting specialist, and one reports to the student information system supervisor. Attendance enrollment technicians access the student information system and other data systems to gather, analyze, validate and report data. The current reporting structure is determined by the nature of the data and reporting requirements. The technician who reports to the student information system supervisor is responsible for preparing attendance data for the first and second principal apportionment reporting periods (P-1 and P-2) and for annual reports, as well as for resolving independent study contract credit issues. The two

technicians who report to the state reporting specialist pull data from the same systems for CALPADS, CBEDS, and other state reports. Although the three positions share a job description and basic functions, cross-training is minimal. Each reporting function is cyclical, with busy and less busy periods.

Best practices for organizational structure include placing like positions under the same reporting structure. This allows cross-training, continuity of function during an employee absence, and the ability to focus resources appropriately during times of heavier workload. Using an organizational structure such as this would eliminate the need to hire a substitute clerk during the busy periods leading up to P-1 and P-2. Changes in the use of data and in reporting requirements extend beyond attendance data. Many school districts that have updated job descriptions and position titles now use a title such as student data technician or student data specialist.

Recommendations

The district should:

1. Change the reporting structure so that all of its attendance enrollment technician positions to report to the state reporting specialist position.
2. Change the title of the attendance enrollment technician position to student data technician to more accurately indicate the responsibilities of the position.

State Reporting Specialist

The state reporting specialist is responsible for certifying CALPADS data as well as submitting CBEDS and Civil Rights Data Collection reports. The position also works closely with school and program administrators to provide custom reports as needed. This position supervises two attendance enrollment technician positions, and together these employees function as a data analysis and reporting team. Although the job description lists the position as an assessment database specialist, it was evident that the job description does not match the responsibilities of the position.

Data teams such as this team at the district are becoming more common in districts of similar size or larger. District leaders realize the importance of accurate data, especially because it can significantly affect the funding a district receives under the Local Control Funding Formula (LCFF). Because individual programs rely on student data for LCFF funding and grant proposals, the demands on a knowledgeable and responsive data team will continue to increase. The position title of state reporting specialist does not accurately reflect the breadth and scope of current data demands, which extend beyond state reporting.

Recommendations

The district should:

1. Change the title of the state reporting specialist position to data services supervisor.
2. Create a job description that accurately describes the role and responsibilities of the current position.

Database Administrator

The database administrator creates, maintains and accesses the data in the database of each software application. Working mainly in the student information system, the database administrator is responsible for the secure transfer of student and staff data to other software systems, thus reducing the need for duplicate data entry. The position reports directly to the director, systems integration.

Districts that have developed data teams include a database administrator as a vital team member. The database administrator knows where discrete data elements are stored, the architecture of each database, and how to retrieve the required data for routine and ad-hoc reporting. As the district organizes a data team, it will need to include the database administrator as a key member.

Recommendation

The district should:

1. Make the database administrator position part of the data team and have the position report to the data services supervisor.

Technical Support Staffing and Organization

The district divides network and desktop technical support responsibilities between a network team and an information technology (IT) operations team. The three-person network team focuses on technology infrastructure, including network cabling and equipment. This team manages the data center, network configurations, wireless, and telecommunications for all school sites and administrative offices. The IT operations team deals more directly with user equipment and support requests. IT operations includes first-tier support from desktop technicians and help desk technicians. In addition, two network technicians, a supervisor, and a manager position provide oversight on critical projects as well as higher level support for widespread or complex issues.

The work of these two teams frequently intersects, despite the structural separation in the district's technology department organizational chart. The success of the IT operations team's 1-to-1 tablet initiative depends in part on wireless access and network configuration upgrades managed by the network team. The network team's efforts to redesign network policies and configurations require an immediate response from the desktop technicians to update staff and student device settings. Despite the clear interdependence of the teams, the two teams have minimal opportunities to collaborate on projects and problem-solving. The job analyses that follow document the organizational structure and staffing deficiencies that contribute to communication and support gaps in the district's technical support teams.

Network Team

Both instruction and administrative operations rely on a reliable network infrastructure. Students and teachers frustrated by slow or unreliable connectivity will abandon efforts to use technology in the classroom (Project RED, pg. 53; see full reference at the end of this letter). School districts with successful educational technology programs build and maintain adequate bandwidth, high-density wireless support, effective monitoring tools, and a responsive support team.

The district's network is supported by three positions: the senior network engineer, the network engineer, and the VoIP programmer and technician. The network team is responsible for wide area network (WAN), local area network (LAN), storage and telecommunications technologies. The district has invested in web-based educational software and a large-scale 1-to-1 tablet initiative. Those initiatives, along with growth in technology use, have strained the district's network. Continuous connection to the internet requires wireless designed to support high use in a dense environment. The district's current wireless installation provides coverage in most locations; however, it is not adequate to support large numbers of concurrent users. The district succeeded in passing a general obligation bond to fund facilities improvements, including technology upgrades. The bond funds allowed the technology department to contract with consultants to expedite wireless upgrades at all schools. However, the network's lack of speed and reliability remain a consistent source of frustration for school and district staff.

School staff reported that they struggled to connect a full class set of devices to the internet during class. In a 2016 BrightBytes survey administered by the district, only 30% of the district's teachers described internet speed as excellent or above average. Technology staff reported similar concerns. First-tier technology support staff described recurring and disruptive issues with connectivity at the schools. Tablets lose connection to wireless and to the district's central computer management tools, including Microsoft Active Directory. Incorrect or incompletely configured virtual local area network (VLAN) settings contribute to access problems at the schools. Network changes not communicated to the technical support teams affected technicians' ability to diagnose and resolve issues at schools.

Network team job descriptions are narrowly defined; each team member has formal responsibility for specific technologies. Nevertheless, the team has engaged in cross-training to ensure coverage of critical needs. The 1-to-1 tablet initiative and bond projects have rapidly increased the volume of work. Most notably, requests for wireless access improvements have increased. To meet the need, the team applies temporary workarounds. Staff attach wireless access points to carts rather than mounting them in the classroom. Network team staff omit key steps, including labeling equipment and communicating changes to schools and desktop technicians. The workarounds and rushed projects contribute to difficulties diagnosing network issues and result in lingering frustrations with wireless performance.

Senior Network Engineer

The senior network engineer supervises and manages technical issues escalated by a network engineer and a voice over internet protocol (VoIP) programmer and technician. The senior network engineer is a member of the technology management team and reports to the CTO. The job description for the senior network engineer emphasizes network design, planning for growth, and project management and coordination with other technology department teams and district departments. The job description also references specific technologies that are now out of date, making the document obsolete. The position calls for a high level of technical expertise, including WAN, LAN and data center technologies.

This position works mainly as a technical lead for large infrastructure projects and in managing the district's data center. The senior network engineer provides direct support on complex technical issues, but usually delegates routine, site-based LAN, wireless and VoIP issues to the two other members of the team. Collaboration with other teams in the technology department is limited to specific, known issues. First-tier technology support teams expressed concerns regarding the lack of documentation and communication regarding network configuration changes (known as change control), and communication and engagement between this position and the network technicians on the IT operations team.

Network Engineer

The network engineer position has primary responsibility for network switching and routing, VLAN restructuring, and WAN upgrades. The job description calls for a high level of technical expertise in network and telecommunications technology. This job description also contains references to specific technologies that are out of date. Expectations for design, documentation, project management and long-range planning of the network distinguish the position from the VoIP programmer and network administrator positions. This position also acts as a backup for telecommunications issues. The network engineer is a supervisory position which accommodates the need for direct supervision of employees on projects as well as the high degree of autonomy this role requires. During interviews, desktop support and help desk staff raised concerns about the accessibility of this position. The volume and pace of project work leaves little time for monitoring the network, refining configurations and resolving reported issues.

Voice over Internet Protocol (VoIP) Programmer and Technician

The VoIP programmer and technician's job description narrowly defines the role as providing telecommunications system installation and support. The job description states that the position reports to the IT operations manager. However, the position is a member of the network team and reports to the senior network engineer, and the focus of the position is divided between telecommunications and wireless support. During peak periods, telecommunications changes related to staff relocations require the technician's full-time attention. Wireless tickets accumulate during these times without sufficient staff to meet the growing needs. Instability in the network from multiple, overlapping initiatives further delays resolution of critical wireless issues.

Recommendations

The district should:

1. Develop change control and project status reporting procedures to keep all technology support staff informed of network changes that may affect users.
2. Establish a regular meeting of the network team and the network technicians on the IT operations team to identify and resolve widespread issues.
3. Make it a priority to provide cross-training on wireless technology for all network team staff.
4. Review the network team members' job descriptions and eliminate references to specific manufacturers and versions of technology. Ensure that job descriptions focus on the underlying skills needed to support the network.
5. Change the VoIP programmer and technician job description and title to more accurately describe the role and reporting structure of the position in providing network support for a variety of technologies, including telecommunications, wireless and LAN equipment. An appropriate title would be network specialist.
6. Add a second network specialist position to meet expanding wireless needs and perform other network upgrades and maintenance.

IT Operations Team

Responsive, quality user support is a key factor in technology adoption in schools. In school districts with 1-to-1 programs, technology becomes part of everyday teaching and learning, and teachers and students require nearly immediate support responses to prevent disruption to classroom activities. In a review of nationwide 1-to-1 programs, researchers found that "if it takes more than thirty minutes to repair or replace a device, the teacher's ability to deliver instruction is impacted" (Project RED, pg. 85; see full reference at the end of this letter). Without adequate support, technology programs intended to transform instruction do not substantially change classroom learning. To introduce project-based and personalized learning opportunities afforded by technology, teachers need to trust that devices will be available and supported on an ongoing basis.

The district's IT operations team provides support for all users' technology equipment, including the 1-to-1 tablet initiative. The IT operations manager oversees the team, which includes a technology

operations supervisor, two network technicians, three help desk technicians, and nine desktop technicians. School employees expressed optimism regarding the recent addition of two permanent desktop technicians and efforts by the department to be more responsive to needs at schools. However, interviews and survey data show that the increased support still does not meet those needs. In the district's 2016 BrightBytes survey, 40% of staff reported that hardware issues take more than a week to be resolved or that help was not obtainable. Forty-four percent of teachers described the quality of support for problems that disrupt instruction as below average, poor, or nonexistent. More than 8,000 Windows tablets have been added in the first phase of the 1-to-1 tablet initiative, and the district expects to install 15,000 additional devices soon, adding pressure to the already taxed support team.

IT Operations Manager

The IT operations manager position directly supervises 15 technical staff and reports to the CTO. The job description lists LAN oversight, budget development, supervision, asset management, procurement and technical problem solving as defining responsibilities. The job description overlaps significantly with the role of the senior network engineer in the areas of network planning, wireless management, and telecommunications.

The scope of the IT operations manager's role has grown in response to the 1-to-1 tablet initiative and the implementation of the general obligation bond. The IT operations manager is a hands-on technical lead for the district's server and electronic storage. However, the focus of the position is leadership of the technical support teams. The demands of the 1-to-1 tablet initiative and growing support needs have stalled a number of projects under the IT operations manager's direction. Desktop support staff expressed concern about the lack of progress on server relocations, device management, and email system transition. To manage the growing work, the district has relied on contractors for device deployment and infrastructure projects. The transfer of knowledge at the conclusion of projects has been incomplete, and IT operations staff feel unprepared to take over the technology after the contractor completes the work. New systems and tools are rushed to production without adequate testing, which compounds frustrations about support. The district reviews and changes tablet standards every six to 12 months. Desktop technicians quickly create an image, which includes a standard set of policies, settings and default software. Contractors hired to help deploy tablets install the image on each new device but conduct little or no integration testing. When the devices arrive at schools, technicians routinely discover missing drivers or other incompatibilities that prevent the tablets from working properly with existing document cameras, printers, software, and network equipment. However, the technicians do not have the central management tool needed to remedy the issues without significant manual effort.

School site and technology staff consistently identified a lack of communication as a technology support deficiency. Schools reported confusion regarding processes used to resolve common issues such as device replacement, providing technology for new staff, and moving equipment. Although the IT operations manager meets regularly with the team, the structure of the meetings does not allow for staff to work together on known issues or to identify the root causes of recurring issues; rather, meeting time is usually spent providing updates on projects or engaging in team-building activities. In addition, members of the IT operations team do not have opportunities to discuss ongoing network reliability concerns with the network team.

Recommendations

The district should:

1. Revise the IT operations manager's job description to clarify the role and eliminate duties that fall under the network team.
2. Ensure that the IT operations manager and CTO develop a transition plan for technologies that are managed and known only by the IT operations manager.
3. Improve communications to school sites regarding technology support procedures and policies.
4. Ensure that technology staff meetings are structured to allow sufficient time to discuss issues and resolve problems.

Technology Operations Supervisor

The job description for the technology operations supervisor position includes project leadership, user training, data security, support team supervision, and asset management. The role of this position has changed from acting as the direct supervisor and contact for issues escalated by the desktop support team to focusing on managing the logistics of bond-funded projects. The role no longer includes direct supervision of the desktop support team; however, it does require project-specific coordination of desktop support and network team staff.

For bond projects, the position verifies equipment purchasing needs, the scope and timing of infrastructure upgrades, and scheduling of staff and vendors to complete the work. When staff are displaced because of work on facilities, the technology operations supervisor also coordinates the physical move of staff technology equipment. For the 1-to-1 tablet initiative, the position is responsible for asset management, including verifying that teachers have the correct equipment and coordinating recovery or replacement of lost or stolen devices.

During interviews, school employees raised concerns about the 1-to-1 tablet initiative and asset management. A lack of clarity regarding responsibility for lost, stolen and damaged equipment led to long delays in device replacement. Doubts about the longevity of the program have contributed to teachers' reluctance to change instructional practices, and school administrators' fear that schools will not have sufficient funding to replace devices after the initial bond-funded rollout.

Recommendations

The district should:

1. Change the technology operations supervisor position title and job description to accurately portray the duties being performed. Consider changing the position title to special projects supervisor.
2. Adopt consistent project management standards to improve communication and execution of projects.
3. Clarify and communicate information regarding responsibility and funding availability for replacement devices to minimize disruptions caused by lost, stolen and damaged equipment.

Help Desk Technicians

A well-functioning, central help desk is an essential component of support. Having central teams with the expertise and tools to resolve the most common requests is an efficient way to provide quality, responsive customer service. The district support team includes three help desk technicians, who provide first-tier support for a variety of technology issues. The job description details expectations related to triaging user requests, providing high-quality customer service, and monitoring systems, equipment, staff and outstanding issues. The help desk technicians also provide quotes for technology needed at schools.

Help desk staff reported a busy but manageable workload, with approximately 80% of issues reported using the help desk software and 20% reported by phone. The district adopted Zendesk help desk software, which is designed to provide efficient routing of tickets, detailed reporting, and development of a self-service knowledge base for users. Staff shared help desk software data on the number of tickets submitted during the month preceding the review. During that month, the district averaged more than 300 open or pending tickets each day, approximately 50 of which were newly created. School site and technology department staff both stated that tickets were acknowledged immediately but often took three days or more to resolve. Staff also reported that schools had developed processes independent of the help desk to share issues directly with desktop support staff.

For issues reported through the help desk software, the three help desk technicians attempt to provide a resolution at first contact with users. However, most issues related to the 1-to-1 tablet initiative are forwarded to desktop technicians because remote management and imaging tools are not available. When asked about common and recurring issues, the help desk technicians echoed the concerns expressed by school staff: users' folders and desktop icons disappear, tablets drop off of the Microsoft Active Directory domain, and devices are unable to connect because of security errors between the device and network. The team addresses recurring issues using workarounds, including frequent reimaging of devices, which is disruptive to users.

The district lacks documentation on common technical issues and troubleshooting procedures. The new help desk software allows for an online knowledge base for internal technology staff and users. Because many of the first-tier support staff are new to their roles or to the district, help desk and experienced staff share institutional knowledge informally. As the district's technology program expands, more formal processes and documentation will be needed to ensure continuity of support.

Recommendations

The district should:

1. Make a formal plan to create a technical knowledge base and procedural document repository, beginning with recurring issues reported through the help desk.
2. Establish consistent procedures for schools to report issues, with the goal of reducing the number of requests that bypass the help desk.
3. Work with schools to develop expectations for response time on reported issues, and monitor progress toward those expectations.

Network Technicians

The district's two network technicians serve as systems administrators. The job description provides minimal detail on the expectations for these positions, and includes a vague reference to assistance with various network tools and systems. Many of the skills described as minimum qualifications for the

position are outdated or irrelevant. The job description does not clearly identify the distinguishing characteristics of the position or an accurate reporting structure.

The network technicians manage Microsoft Active Directory and Microsoft Exchange, which are the main systems for user account, email, group membership, and permissions management. In addition, they work with the desktop technicians on printer setup, software deployment, and escalated issues with user accounts or devices. The IT operations manager has assigned the network technicians to support the internet content filter and other related technologies that overlap with their areas of expertise.

The district operates two Active Directory domains: K-12 and Admin. Domains in Active Directory define a set of common policies and settings for users and devices. Each network technician has primary responsibility for one of the domains. The segmentation of the two domains has contributed to technical and resource problems. Staff attributed many of the ongoing 1-to-1 tablet management issues to the disjointed domain structure. In addition, because each domain contains its own set of unique policies and standards, the network technicians are unable to fully perform duties for each other as needed. Although consolidating the two domains would be initially disruptive, it would reduce complexity and increase efficiency in the management of users and devices.

Technology staff expressed concern about the ability of the network technicians to be responsive during peak periods, including during the start of the school year. The volume of staff and student changes in the domain configuration creates delays in keeping accounts up-to-date and associated with needed resources. The network technicians create each new user account and administer all account changes manually upon notification from the help desk team. The central software management tools used are unreliable. The setup of the remote management software, Absolute, was not completed. Because of the volume of changes, the workload, and the reliance on manual processes, the network technicians struggle to document and communicate changes that affect the desktop support team.

Recommendations

The district should:

1. Revise the title and job description of the network technician positions to reflect their role as system administrators. The job descriptions should include the reporting structure of the positions, which report directly to the IT operations manager.
2. Invest in consolidating the K-12 and Admin domains.
3. Implement an automated account management tool to reduce manual user account creation and changes.
4. Evaluate and fully implement a solution for central device management, including reliable remote deployment and updating of policies, software, and drivers.

Desktop Technicians

In many school districts, desktop technicians become the face of technology support. School districts with robust technology programs include accessible, dedicated, on-site technical support for staff and students. In anticipation of the 1-to-1 tablet initiative, the district increased desktop support from seven to nine desktop technicians. The desktop technician job description defines the role broadly, including training, providing general technical assistance, first-level network problem-solving, and support for a wide range of technologies.

The nine desktop technicians serve 65 schools and administrative offices. Even with the increased support, the technicians typically visit each site only once every two weeks. Desktop technicians reported ending each day with at least seven to 15 unresolved tickets in the help desk. The large number of sites assigned to each technician contributed to a transactional relationship with site staff: technicians visit sites briefly to fix reported issues but do not routinely work with sites on planning for technology purchases, discussing goals for technology use, or discussing the overall health of technology at the school site. Sites credited the technology department with improvements in service over the past year, but also cited examples of deficiencies as a result of rushed work and lack of understanding of staff needs. For example, devices have been reimaged without diagnosing a root cause of wireless connectivity problems. In addition, after replacing computers, rather than ensuring that all data was transferred to the replacement computer, desktop technicians left old computers in place to decrease the risk of losing access to locally stored documents and software applications.

As described in the network technicians section above, remote imaging and management tools are either unreliable or nonexistent. The lack of management systems increases the strain on desktop technicians and necessitates extended in-person visits to sites for issues that could otherwise be fixed remotely and quickly. Thus staff experience long delays in resolving problems that could be addressed immediately with the right remote management tools. To augment on-site support, schools have teacher technology leaders (TTLs), who receive an hourly stipend to help with the instructional technology at their schools. Although the TTLs documented role focuses on improving staff members' skills and abilities, in reality they are often redirected to fixing problems that fall under the role of the desktop technician. The TTLs frequently have a full-time course load during the day and are unable to provide the same-day, in-classroom responses required to meet the district's technology needs.

Employees also mentioned concerns about the effect of device selection on support. School site staff stated that they had little input on the 1-to-1 tablet initiative and device standards used districtwide. Schools also reported that the device standards change frequently and that a one-size-fits-all approach did not accommodate the differences in students' ages or in school programs. The adopted Windows tablet standard was frequently reviewed and modified, resulting in changes in manufacturer, model and configuration of the standard. Initial imaging and installations of the tablets are managed by a contractor. However, the desktop support team supports the devices once installed. The need for multiple images in an environment without enterprise management tools introduces significant complexity and requires additional ongoing staff time.

The desktop support team uses online chat and email to collaborate on common issues, and the technicians also use these methods to arrange coverage for large projects, high-priority issues and absences. Constraints on network technician's and IT operations manager's availability have encouraged the desktop technicians to create an informal hierarchy to manage higher-level technical tasks. More experienced desktop technicians have assumed responsibility for developing and maintaining images, packaging software for installation, training new technicians, and addressing escalated technical issues.

The number of desktop support staff is insufficient to support the 1-to-1 tablet initiative and ongoing technical support needs at school sites. Only three percent of teachers reported being able to get same-day help for technology hardware repairs in the 2016 BrightBytes survey. Thirteen percent of teachers reported that they could not obtain help with technology planning. The lack of available onsite support erodes teacher confidence in using technology.

FCMAT's proposed reorganization of technology staffing includes the dedicated support needed to implement the technology program defined in the district's technology plan. The proposed reorganization

includes an increase in first-tier technicians (technology support specialist 1) to provide daily on-site support for all schools. In addition, FCMAT recommends creating two, second-tier technician positions (technology support specialist 2) to coordinate projects, develop and document standards, and resolve complex or widespread technical issues. The creation of a tiered structure will address inconsistencies in the current level of work the technicians perform, create a structure for technicians to seek assistance and escalate issues, and provide a pathway for promotion. Because of variations in school size and program requirements, the technical support needs differ among schools. For example, high schools usually require more staff time and a higher level of technical support than elementary schools.

For most districts, a 0.5 full-time equivalent (FTE) technical support position can meet the needs of an elementary school, and because both staff and programs usually increase in secondary schools, a 0.75 FTE technician can adequately support a middle school. A full-time technician is usually required to support a high school technology program. The district also has a significant number of small and alternative schools. It would benefit the district to have one 1.0 FTE technician position to serve all of these sites. Because of the large number of central staff and planned relocations necessitated by facilities improvements, it would also benefit the district to have a dedicated administrative office support position for technology.

The following tables show the recommended technology support specialist positions.

Technology Support Specialist 1 (Direct Site Support)

School/Site Type	Number of Sites	FTE Per School	Total Recommended FTE
Administrative	NA	1.0	1.0
Alternative/Small Schools	4	0.25	1.0
Elementary	40	0.50	20.0
Middle	8	0.75	6.0
High	9	1.0	9.0
Total	61		37.0

Site Technology Support: Current and Proposed

Current Title	Current FTE	Proposed Title	Proposed FTE	Net Increase
Desktop Technician	9.0	Technology Support Specialist 1	37.0	28.0
NA	0.0	Technology Support Specialist 2	2.0	2.0

To provide the staffing outlined above and to provide optimum support coverage, the district would need up to an additional 28 technology support specialist 1 positions and two technology support specialist 2 positions. The number of positions would need to be increased in phases to create a sustainable technology program with highly skilled technicians. This would allow the district to add several positions at a time, possibly mirroring the phased implementation of the 1-to-1 tablet initiative. After each increase, the district would need to reevaluate support needs using available help desk data, surveys, and feedback from schools to determine if additional increases in the number of positions are justified.

Recommendations

The district should:

1. Update the desktop technician position title and job description to include the broader technology support role of the positions. Technology support specialist 1 would be an appropriate title.

2. Create two technology support specialist 2 positions to provide formal positions with additional responsibilities for imaging and device management, create a structure for escalating technical issues, and provide a path for promotion.

3. Increase desktop support (technical support specialist 1) team staffing in phases over time to align with best practices in supporting a 1-to-1 education technology program. Seek to achieve a staffing level of 1.0 FTE per high school, 0.75 FTE per middle school, and 0.5 FTE per elementary school.

4. Draft device and software adoption processes that take into account instructional needs, device manageability, device fitness for purpose, and total cost of ownership.

Technical Services Coordination – Technical Services Director (New Position)

The 1-to-1 tablet initiative, bond-funded facilities improvements, school infrastructure upgrades, and a series of necessary technology department projects have substantially increased the workload of the district's technical teams. Throughout FCMAT's interviews, school site and technology department staff identified gaps in project oversight and communications. To compensate for the increased work and urgent timelines, the technology department used contractors to accelerate critical projects.

Contractors can successfully augment staffing for the short term and can provide specialized expertise. The district has used contractors to help with large, concurrent and interdependent projects. However, different contractors, staff and teams are responsible for each initiative, and this fragmented ownership of projects creates conflict during integration. The 1-to-1 tablet initiative were deployed on time, but the school site wireless upgrades and device management projects have fallen behind that deployment. As a result, schools receive devices that cannot yet connect to an adequate wireless network and cannot be managed efficiently.

In addition, the structural separation of the network team and the IT operations team affects staff members' ability to identify and respond to systemic issues. Issues that fall completely within the domain of one functional team are resolved quickly; however, issues that cross departments remain unresolved for long periods of time, creating frustration at the schools and within the department. Information Technology Department staff consistently described change control, project management, collaborative problem-solving, and improved communication as high-priority needs across teams.

A technical services director position would help improve communication, project management, and coordinated delivery of services, resulting in improved services to the schools and district office staff. Coordination with educational services regarding priorities and problem solving would also be improved as a result of improved organization and oversight of the group.

Recommendations

The district should:

1. Create a director-level position to oversee the network team and the IT operations team. Director of technical services is a common title for such a position.

2. Ensure that the director of technical services and CTO identify dependencies between active and future projects and create procedures to monitor risks associated with missed timelines.

3. Appoint a single point of contact for development of bond project technology standards and oversight.

Senior Administrative Secretary

The senior administrative secretary reports to the CTO and helps with technology department operations. The job description defines the position as administrative support to a cabinet-level position; this includes clerical functions and document management. In practice, the senior administrative secretary provides operational support for the technology department as a whole. The bond effort and other technology investments have shifted the focus of the position toward budget and compliance functions. The senior administrative secretary helps with purchasing, bond compliance forms, contract work flow, and board approvals for technology.

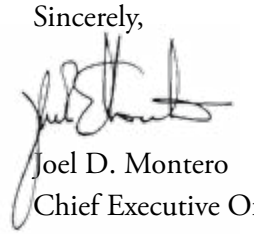
Recommendation

The district should:

1. Update the job description of the senior administrative secretary position to include the duties and skills required to provide operational support for a large department.

This concludes the FCMAT study team's findings and recommendations. FCMAT appreciates the opportunity to serve the West Contra Costa Unified School Districts and extends thanks to all the staff for their assistance during fieldwork.

Sincerely,



Joel D. Montero
Chief Executive Officer

Reference:

Project RED

Greaves, T.; Hayes, J.; Wilson, L; Gielniak, M.; & Peterson, R., *The Technology Factor: Nine Keys to Student Achievement and Cost-Effectiveness*, MDR 2010.

https://www.k12blueprint.com/sites/default/files/Project-RED-Technolgy-Factor.pdf

Project Red is a literature review and survey study of 997 schools throughout the U.S. regarding technology integration and its impact. It includes comparative findings on 1-to-1 schools and higher student-to-computer ratios, as well as breakdowns by region and demographic groupings. The study used regression analysis, principal component analysis and predictive modeling.