



Integration of Digital Devices in Public Schools

Health and Safety Guidelines

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Introduction

In June 2021, the governor signed House Bill (HB) [3489](#), which added new Texas Education Code (TEC) [§38.0231](#) requiring the Texas Education Agency (TEA), in consultation with the Health and Human Services Commission (HHSC), to develop and distribute model health and safety best practice guidelines for the use of digital devices in local education agencies (LEAs) beginning with the 2023-2024 school year.

The guidelines must be based on evidence-based studies and practices, consider the needs of students with intellectual or physical disabilities, and consider the potential costs of implementation of the guidelines and affordable ways to reduce the hazards associated with the extended use of digital devices and address:

- use of digital devices for varying ages and developmental levels;
- amount of class time a student spends using digital devices in the classroom;
- appropriate frequency for breaks from the use of digital devices;
- physical positioning of digital devices in the classroom;
- use of digital devices to complete homework assignments; and
- recommendations regarding total daily screen time usage for students, practices or software to block access to inappropriate content, and teacher training regarding digital device use in the classroom to ensure implementation of best practices.

The law requires LEAs to adopt a policy for the effective integration of digital devices in the district or school. The LEA may adopt the guidelines included within this document to meet the requirement or develop their own. These guidelines must be posted on the LEA's Internet website.

Each LEA that adopts the guidelines within this document may implement the guidelines in a manner that best meets the LEA's individual needs and the individual needs of students in the district or school, including students with intellectual or physical disabilities. LEAs shall implement these guidelines within the parameters of federal law governing Individual with Disabilities Act (IDEA) and Section 504 of the Rehabilitation Act.

The Law Insider (2022) defines a digital device as an “electronic device that can create, generate, send, share, communicate, receive, store, display, or process information, which includes, but is not limited to, desktops, laptops, tablets, peripherals, servers, mobile telephones, smartphones, and any similar storage device which currently exists or may exist as technology develops”.

Technological advancements have broadened ways for students and teachers to engage in the educational process which has increased the number of digital devices used in classrooms. It has become challenging for LEAs to balance asynchronous and synchronous methods of instruction while ensuring appropriate use of digital devices. While the use of digital devices in LEAs can add to the educational process, there are growing concerns regarding the frequent use of digital devices and the impact on student health. Research has correlated harmful physical health

outcomes with excessive use of digital devices during childhood and adolescents such as higher levels of depression (International Journal of Public Health. 2015 Feb; 60(2): 147-55.), negatively impacting sleep (deprivation) (increased lack of sleep) habits (Edutopia, 2020), and increased rates of obesity (Journal of Pediatrics. 2011 Feb; 127(2): e330-5. Doi: 10.1542/peds.2010-1235.).

Device Use for Varying Age Ranges and Developmental Levels

Rationale/Background:

As technology advances, accessibility to digital devices increases. Increased accessibility to digital devices in LEAs significantly changes the dynamic of the teaching and learning process and the developmental stages and educational use of technology should be taken into consideration. Additionally, more students are expected to access instructional materials and resources on digital devices. In fact, LEAs are redesigning their curriculum to ensure that students are prepared to meet technology-driven job labor markets. When digital devices are implemented successfully, students are able to draw stronger connections between the content and real-world applications of technology.

Guidelines:

LEAs may form partnerships with families to support virtual learning via digital devices while helping families balance their student's screen time. Sharing the responsibility between the family and LEA is essential for academic reasons as well as to assist with building positive habits that promote physical and mental health.

LEAs and families must work together to balance their student's/child's time with digital devices and other activities, including getting outdoors, engaging in hands on activities, and having face-to-face interaction with peers.

Developmental stages and educational use of digital devices:

1. Demonstrate how to select and use digital devices appropriately to explore emerging technologies.
2. Balance effective and responsible use of digital devices based on the student's age and appropriate developmental stage (Boston Children's Hospital, 2020).
3. Use various types of media and digital devices in the classroom that appeal to and support different types of learners and learning styles (LearnSafe, 2018).
4. Model and teach the concepts of being digitally responsible and explain that all people have a moral and ethical responsibility when using digital devices and social media and that it should be done in a safe, legal, and socially responsible way.
5. Explain what is appropriate and not appropriate to share such as explicit messages or images and what the legal consequences may be (Boston Children's Hospital, 2020).

Considerations for student and parent use of digital devices at home:

1. Make mealtime family time. Turn off all digital devices, including television during meals.
2. Discuss and determine appropriate time limits for use of digital devices and social media.

3. Parents should set a good example for their children by limiting their own use of digital devices and social media (American College of Pediatricians, 2020).
4. Develop a family media use plan that takes into consideration your child's age and developmental stage.
5. Promote getting outdoors or engaging in other extracurricular activities or sports to get the recommended 1 hour per day of physical activity.
6. Promote activities that facilitate development such as reading, writing/journaling, or interacting socially with get-togethers.
7. Recommend that children not sleep with digital devices in their bedrooms and discontinue use of devices at least 1 hour prior to bedtime (American Academy of Pediatrics, 2016).

Amount of Time Students Spend Using Digital Devices in the Classroom

Rationale/Background:

Advancements in technology and the demand for more blended virtual learning options has exponentially increased the amount of time students spend using digital devices over the past several years. This has increased concern surrounding the correlation between the amount of time students spend on digital devices and potential health risks. Correlational studies have shown that 8- to 11-year olds with increased screen time have scored lower on cognitive assessments. A combination of screen time and too little sleep has also been associated with heightened impulsivity in the same age group.

Researchers have also found links between screen time and various health outcomes in teens with the strongest associations between screen time and obesity and screen time and depressive symptoms (American Psychological Association, 2022).

A recent study revealed that 8- to 12-year-olds in the United States now use screens for entertainment purposes for an average of 4 hours, 44 minutes a day while 13- to 18-year-olds are on screens for an average of 7 hours, 22 minutes each day (Rideout & Robb, 2019).

The Centers for Disease Control and Prevention (CDC) reports on average, 8- to 10-year-olds in the United States spend 6 hours a day using screens for entertainment purposes, 11- to 14-year-olds spend 9 hours, and 15- to 18-year-olds spend 7 hours, 30 minutes each day (OSF Healthcare, 2022).

Both studies focused on the amount of time using screens for entertainment purposes. Neither study addressed the amount of time students used screens for classwork or homework. Therefore, a recommendation cannot be made for how much time students spend using digital devices in the classroom.

Guideline:

Given the research, LEAs will need to establish a standard for the appropriate amount of time students should use digital devices in the classroom.

Appropriate Frequency of Breaks from the Use of Digital Devices

Rationale/Background:

It is important to consider best practices related to the amount of time spent using digital devices and the appropriate use of breaks from such devices. Extended use of digital devices has been linked to negatively impacting physical and mental health, negatively impacting sleep due to increased blue light exposure, which suppresses melatonin levels and shifts circadian rhythms, and vision related problems (Screen Time Can Be Dangerous for Kids' Mental and Physical Health, 2017; and The Negative Effects of Technology for Students and Educators, 2021).

Guidelines:

Strom and Moffit recommend that students should take breaks from using digital devices every 30 minutes.

However, the American Academy of Ophthalmology (AAO) (2020) recommends following the 20-20-20 rule to reduce eye strain. Every 20 minutes students should look at an object at a minimum of 20 feet for at least 20 seconds to give your eyes a break and to allow them to reset. The AAO also recommends blinking frequently to keep your eyes from drying out.

Given the research, LEAs will need to establish a protocol for the appropriate frequency of breaks from the use of digital devices in the classroom based on student's needs.

LEAs and parents should be mindful of the amount of time their students are spending using digital devices, ensure that content is safe and age-appropriate, and set clear boundaries. Students should avoid using digital devices or other types of social media at least 1 hour prior to bedtime to maintain a healthy sleep pattern (American Academy of Pediatrics, 2016; and The Negative Effects of Technology for Students and Educators, 2021).

Physical Positioning of Digital Devices (Ergonomics)

Rationale/Background:

Ergonomics, sometimes also referred to as human engineering, is the study of the relationship between people, their work tasks, and their physical environment. Drawing from a variety of disciplines, it applies designs and practices to optimize the interaction between the person and the work environment in relation to designing tasks, workspaces, controls, displays, tools, lighting, and equipment to fit a person's physical capabilities and limitations (Center for Disease Control (CDC) and Prevention, 2018). For example, without appropriate physical positioning, digital device use could result in musculoskeletal disorders such as neck, back, or shoulder pain due to improper posture, wrist discomfort due to improper positioning of keyboard, and headaches due to increased screen time, eye fatigue, and improper positioning of the digital device screen. The objective of appropriate physical positioning is to enhance the comfort, safety, and quality of the instructional surroundings during the learning process. The following practices are recommended for educators and parents to consider in face-to-face as well as virtual learning environments when using digital devices.

Guidelines:*Proper Posture and Positioning*

1. Straight upper torso
2. Neck is upright and not turned, tilted, flexed, or extended
3. Upper arms hang vertically alongside the torso with shoulders relaxed, forearms horizontal, and elbows close to the body
4. Wrists are straight and not bent
5. Spine is erect or upright
6. Thighs are in a horizontal position and lower legs are vertical with feet resting on the floor or a footrest
7. Soles of feet are at a 90-degree angle with the lower legs (OHCOW Sarnia & Windsor Clinic, 2021)

Physical Environment

1. Work in well-lit spaces and position digital devices to avoid glare or use screen filters as needed.
2. Work area must be large enough to support all materials to avoid excessive reaching or twisting of the body. School/class materials and digital device keyboard should be within easy reach and body should be centered on the alphanumeric part of the digital device keyboard (Cornell University, 2000).
3. Position the digital device screen to allow for neutral neck postures. The digital device screen should be an arms-length away directly in front of the user and eyesight should be at the top portion of the screen.
4. Adjust brightness and contrast of digital device screen as needed to match the level of light around you (OHCOW Sarnia & Windsor Clinic, 2021).

LEAs will need to train staff, students, and parents and provide information about proper physical position when using digital devices either at school or at home.

Use of Digital Devices to Complete Homework Assignments**Rationale/Background:**

The review of literature did not identify research specific to the use of digital devices for the completion of homework assignments. The review did however identify research related to a broader context of using digital devices for social or recreational purposes. Therefore, a recommendation cannot be made for the use of digital devices to complete homework assignments.

Guideline:

Given the lack of research, LEAs will need to establish a protocol for an appropriate amount of time students should use digital devices for completing homework assignments.

Recommended Total Daily Screen Time Usage for Students

Rationale/Background:

Various research studies have been conducted and the amount of time students spend using digital devices varies based on access to and type of digital device, a student's age, grade, gender, geographic location, socioeconomic status, and level of academic engagement with the digital device; therefore, making one global recommendation for the amount of time students should spend using a digital device a challenge.

The American Academy of Pediatrics (Forbes Health, 2022) and the World Health Organization (WHO) (Guidelines on Physical Activity, Sedentary Behaviour, and Sleep, 2019)

Guidelines:

According to Stanek (2022), the American Academy of Pediatrics (AAP) has recommendations based on varying ages. The World Health Organization (WHO) (2019), also has established varying guidelines. In the table below you will see the differences between the recommendations of the two organizations.

	Ages 2-5	Ages 5-8	Ages 9+
American Academy of Pediatrics	One hour per day (ages 2-5)	No set recommendation for daily screen time (ages 5-8).	Ages 9+ becomes a conversation parents should have about media usage.
WHO	No more than 1 hour (ages 3-4)	No recommendations	No recommendations

Given the research, LEAs will need to establish a protocol for the appropriate amount of screen time usage for students during school.

Recommended Practices or Software to Block Access to Inappropriate Content

Rationale/Background:

From smart phones to tablets and from laptops to desktop personal computers (PCs), at some point, LEAs will have something accidentally pop up when a web page is opened that would be deemed "inappropriate" and potentially be embarrassing depending on the situation whether it be in a meeting, the classroom, or researching the World Wide Web with a student or colleague. In the United States, 73% of young people (93% boys and 62% girls) report that they have been exposed to inappropriate content online before the age of 18 (Screen Time Can Be Dangerous for Kids' Mental and Physical Health). It is considered best practice for LEAs to enable technology and policy controls such as: a technology acceptable use policy (AUP) for staff and students, web proxies, Uniform Resource Locator (URL) content filters, spam filters, email authentication protocols, and policies that document the LEAs approach to the technical controls implemented. These controls set up students and staff to receive legitimate and appropriate content and prevent unsolicited and malicious content.

LEAs send and receive thousands of emails a day. Sometimes it is difficult to tell if emails received are legitimate communications or are sent by spammers trying to infiltrate a district's servers. Securing LEA email systems by using spam protection and email authentication

protocols are crucial in preventing malicious actors from compromising any system. Once implemented, spam protection will remove as well as lessen the risk of receiving malicious email and will delete emails not created by the LEA (Eyes Front Operational Manual).

Guidelines:

A few email authentication protocols that should be enabled at each LEA are:

1. **Sender Policy Framework (SPF)**-An SPF record is a domain name system (DNS) text (TXT) record that specifies which Internet Provider (IP) addresses and/or servers are allowed to send email “from” that particular domain. This is useful for approving third party services that send email on your behalf.
2. **DomainKeys Identified Mail (DKIM)**-DKIM is a TXT record that’s added to a domain’s DNS. DKIM’s intent is to prove that the contents of an email message haven’t been tampered with, the headers of the message have not changed, and that the sender of the email is authorized to send email from the domain that has the DKIM record attached to it.
3. **Domain-based Message Authentication, Reporting, and Conformance (DMARC)**-DMARC is an email authentication policy and reporting protocol that’s built around both SPF and a DKIM and is a DNS TXT record. DMARC verifies that a sender’s email messages are protected by both SPF and DKIM, tells the receiving mail server what to do if neither of those authentication methods passes, provides a way for the receiving server to report back to the sender about messages that pass/fail the DMARC evaluation, and ensures that the displayed fields match the unaltered fields in the email headers (Cybersecurity Coordinator Forum).

To increase the security infrastructure for LEAs, schoolsafety.gov recommends these four steps:

1. **Enable Multi-Factor Authentication:** Multi-factor authentication (MFA) is a layered approach to securing online accounts that require users to provide two or more authenticators to verify their identity. Enabling MFA can make users significantly less likely to get hacked.
2. **Use Strong Passwords:** Passwords are the most common means of authentication. Create passwords that are long, unique, and randomly generated, and use a password manager to generate and store passwords across multiple accounts.
3. **Recognize and Report Phishing:** Phishing attacks use email or malicious websites to solicit personal information by posing as a trustworthy organization. Reduce the risk of phishing attempts by ‘thinking before you click,’ enabling strong spam filters, and training staff and students to recognize and report suspicious activity.
4. **Update Your Software:** Outdated software can contain vulnerabilities that can be exploited by threat actors. Install updates on LEA devices as soon as possible and/or enable automatic updates to protect your systems.

Additional suggestions as recommended practices for LEAs would be to block the capability of being able to download a virtual private network (VPN) to personal devices or LEA issued devices to circumvent filters and to join the [Multi-State Information Sharing and Analysis Center®](https://ms-isac.org/) (MS-ISAC®). The mission of MS-ISAC is to improve the overall cybersecurity posture of U.S. State, Local, Tribal, and Territorial (SLTT) government organizations through coordination, collaboration, cooperation, and increased communication.

There is no cost to join the MS-ISAC, and membership is open to all U.S. SLTT government organizations. Membership to MS-ISAC consists of the following no-cost MS-ISAC services:

- Security Operations Center (SOC)
- Malicious Domain Blocking and Reporting (MDBR)
- Cyber Incident Response Team (CIRT)
- Cybersecurity Advisories
- Cyber Threat Intelligence (CTI)
- Real-Time Indicator Feeds
- Malicious Code Analysis Platform (MCAP)
- Nationwide Cybersecurity Review (NCSR)
- Information Sharing, Cybersecurity Awareness, and Education

Additional fee-based services are available, and they are provided by CIS (Multistate Information and Analysis Sharing Center).

LEAs may also wish to contact their regional education service center (ESC) representative that provides information technology (IT) support services in their area. The ESC may also provide cybersecurity assistance or services similar to MS-ISAC.

Recommended Teacher Training to Ensure Implementation of Best Practices

Rationale/Background:

In Strom and Moffit's (2021) review of the literature, there were few references to professional development or the implementation of best practices. The review indicated that teachers found it difficult to keep up with the rapid deployment of updates to existing technologies. In addition, the lack of professional development required to effectively implement new technology was problematic. (The Negative Effects of Technology for Students and Educators, 2021).

For example, many LEAs have implemented a "one-to-one" initiative of each student having their own LEA issued digital device to access the Internet to use digital curriculum and textbooks. A study conducted by Fredrickson & Gaskill (2019) surveyed 15 LEAs implementing such initiatives and found that only two of the 15 LEAs provided training for staff and attendance was voluntary.

Guidelines:

The following are recommendations to improve implementation and increase the fidelity of training for LEAs to implement digital devices in the classroom setting:

1. To guide and support learning, incorporate applications or tools for collaboration, coordination, and communication when implementing new programs.
2. Decide what new technologies, devices, or tools are necessary for student learning. Be selective and mindful of student engagement strategies and what devices are available before implementing technology.
3. Provide constant training and support to teachers and students when implementing these devices or tools. Teachers need to be well versed with the technology and the programs being used to incorporate these media into their lessons to enhance and impact learning.

4. Incorporate a learning management system (LMS). An LMS is a comprehensive one stop shop to support LEAs, teachers, parents, and students by providing high-quality instructional materials, technology solutions, and professional development resources (The Negative Effects of Technology for Students and Educators, 2021).

Additional resources and recommendations to support implementation of digital learning can be found in the United States Department of Education (USDE) Office of Educational Technology's [Teacher Digital Learning Guide](#). This guide includes key considerations, guiding resources, and reflection questions to assist with planning and implementing technology to meet the needs of students.

The USDE Office of Educational Technology's [School Leader Digital Learning Guide](#) provides resources and recommendations to assist leaders with planning, funding, implementing, maintaining, and adapting digital learning programs to meet the needs of students and their LEAs.

The [EdTech Triangle](#), a research-based model developed by the nonprofit [EverySchool](#), emphasizes using technology that can produce an outcome or develop a skill beyond traditional means. This model is based on research about screens, student achievement, and student well-being and can assist educators with implementing technology in the classroom. For more information on using the EdTech Triangle in your classroom or LEA, please visit the EverySchool [resource](#) page and download the guide [Triangulate](#) (Fairplay's Children's Screen Time Action Network).

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