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Digital Devices in the Classroom

Health and Safety Guidelines

June 2021

Digital Devices in the Classroom: Health and Safety Guidelines

<u>Introduction</u>

The landscape of the PreK-12 instructional environment has changed dramatically as advancements in technology have offered students new ways to engage in their learning. With the growing number of screens being introduced into classrooms, the challenge for educators and caretakers is to maintain a balance between the physical and virtual worlds as well as to ensure that digital devices are being used in appropriate, meaningful, and empowering ways. The increasing reliance on digital devices is a result of advances in science and innovations in technology. While the use of digital devices is the foundation for virtual learning and can enhance the educational process, there are concerns regarding their frequent use on the health and well-being of children. Research has correlated harmful physical health outcomes with excessive use of mobile devices during childhood and adolescence. Strong evidence has also emerged regarding the impact of excessive mobile device use with sleep outcomes. With the increase in the use of digital devices, educators and students are using more technology in blended, virtual, or hybrid models. Considering the impact of the current pandemic (COVID-19) and beyond, it is even more important to consider best practices relating to the efficiency and safety of digital devices.

In January 2020, Virginia legislators passed House Bill 817 requiring the Virginia Department of Education (VDOE), in collaboration with the Department of Health and medical professional societies, to develop and distribute health and safety best practice guidelines for the use of digital devices in public schools no later than the 2021-2022 school year.

> *<u>HB817</u> - Public schools; use of digital devices.*
> *Tracking - https://lis.virginia.gov/cgi-bin/legp604.exe?201+sum+HB817S&201+sum+HB817S*
>
> *That the Department of Education, in collaboration with the Department of Health and medical professional societies, shall develop and distribute for use by local school boards health and safety best practice guidelines for the effective integration of digital devices in public schools no later than the 2021–2022 school year. The guidelines shall be based on peer-reviewed, independently funded studies and shall at a minimum address digital device use for different age ranges and developmental levels, the amount of time spent on digital devices in the classroom, appropriate break frequency from the use of digital devices, physical positioning of digital devices in the classroom, the use of digital devices for homework, and recommended teacher training to ensure best practice implementation.*

The guidelines address digital device use for different age ranges and developmental levels, the amount of time spent on digital devices in the classroom and for homework, appropriate break

frequency from the use of digital devices, physical positioning of digital devices in the classroom, and recommended training to ensure best practices.

The guidelines will include three major focus areas to help support teaching and learning within these online models and include recommended training for school personnel:

- devices and use of/in the PreK-12 classroom,
- screen time, frequency and breaks, and
- Ergonomics and posture.

Training
The VDOE will post the guidelines and other resources and communicate all information to Virginia school divisions. School divisions are encouraged to share and provide training on the guidelines directly with school personnel and students and post the information for parents and all other stakeholders through web portals, learning management systems, and through mass communications including social media platforms.

Suggestions on How to Use this Guide
✓ Print the infographic and post in the school building.   ✓ Present and discuss the guidelines and related resources at a staff meeting.   ✓ Review the guidelines with the school health professionals.   ✓ Include the guidelines in a school newsletter, electronic message, or webpage.   ✓ Review the guidelines with parents and other stakeholder groups.

Workgroup Members:

Virginia Department of Education (VDOE)
Sarah Bazemore, School Counseling Specialist/Student Assistance Systems Coordinator, Office of Student Services
Michael Bolling, Assistant Superintendent, Department of Learning & Innovation
Quyen Duong, Student Services Specialist, Office of Student Services
Reginald Fox, Virtual Learning Specialist, Office of STEM & Innovation
Dr. Meg Foley, Coordinator of Virtual Learning, Office of STEM & Innovation
Martha Montgomery, School Psychology Specialist, Office of Student Services
Vanessa Wigand, Health, Physical, & Driver Education Coordinator, Office of STEM & Innovation
Tracy White, School Health Services Specialist, Office of Student Services

Medical Professionals & Community

Dr. Percita Ellis**,** MD, FAAP**,** Rockbridge Area Health Center
Dr. Nicole Parrish, MD, Child & Adolescent Psychiatry Fellow Physician, Virginia Treatment Center for Children, Virginia Commonwealth University
Joanna Pitts, School Health Nurse Consultant, VDH, School Health Nurse Consultant, Virginia Department of Health, Division of Child and Family Health
Melissa Perry, Director of Community Programs and Public Health, Conexus
Dr. Evan Silverstein, MD, Pediatric Ophthalmologist
Dr. Bela Sood, MD, Professor, Psychiatry and Pediatrics & Senior Professor of Child Mental Health Policy, Virginia Treatment Center for Children, Virginia Commonwealth University
Jacquelyn Wilmoth RN, MSN, Deputy Executive Director, Virginia Board of Nursing, Department of Health Professions

Devices/Age & Developmental Level
As school divisions respond to the changing technological needs of students and teachers, digital devices are being used to enhance teaching and learning. Because of technological advancements, our nation's workforce is changing rapidly. Educators are witnessing these changes and are taking a multifaceted approach to tackling them. They are redesigning their curriculums, integrating technology, infusing 21st Century learning techniques, and more to ensure that our students are ready to meet the demands of an ever-changing labor market. This new paradigm of teaching and learning online supports the use of digital devices and must ensure accessibility for all students.

A digital device is defined as a physical unit of equipment that contains a computer, processor, hard drive, or ability to access the Internet. Today, there are a myriad of digital devices, the list below includes some commonly found in the educational environment:
- computers,
- laptops,
- tablets,
- e-Readers,
- smart devices,
- projector screens,
- smartboards,
- smartphones,
- virtual reality, and
- response systems.

When implemented successfully, incorporating a device provides all students with an opportunity to make deeper connections with the content as well as their learning. Digital devices may be used developmentally in the PreK-12 classroom and at home to enhance teaching and support learning. There is an increased demand for learning materials to be accessible via mobile devices. Students are using technology more than ever before to enhance their learning. Students and parents may have a need to access technology at the same time which is amplified by the required use of digital devices. Understanding how parenting and family dynamics both influence and are influenced by the use of digital devices and media is crucial to identify strategies to benefit child health and development. [8]

The use of electronic media in youth has been linked to an increased risk for developing symptoms of mental illness specifically putting youth at risk for developing anxiety and depression which may require professional attention. Recent research has also demonstrated that electronic media use may also have a positive impact on the mental health of youth including those that already have a mental illness. [8]

The evidence to support digital media either as a positive and a negative element in the life of youth is far from clear and is probably so because of being dependent on multiple variables in the child, their family, and their environment. Indeed, the recent Technical Report published by the American Academy of Pediatrics in 2016 states, "The effects of media use…are multifactorial and depend on the type of media, the type of use, the amount and extent of use, and the characteristics of the individual child or adolescent using the media." [10]

Now, more than ever, schools must work with families to support students as they become digital citizens and learn to balance their screen time. This shared responsibility for educators and caretakers is essential for not only academic reasons but also to build habits that promote healthy mental and physical health. Students must balance their time with media and other activities, including getting outdoors, engaging in hands-on-activities, and having face-to-face time with peers.

Developmental stages and educational use of digital devices:

1. Demonstrate the ability to select and use various types of digital devices, and transfer knowledge to explore emerging technologies. (resource 1 & 3)
2. Balance the effective and responsible use of digital devices/media based on the developmental ages starting with preschool through high school; digital devices/media use at each stage of development is motivated by and influences their growth. (resource 2 & 3)
3. Use digital devices to appeal to and accommodate different types of learners to support the use of technology in the classroom as a tool for creativity, communication, research, modeling, and data analysis. (resource 2)
4. Use digital devices in the classroom effectively to promote active engagement where students are involved in critical thinking, collaborating, creating, problem solving, and expressing. (resource 2)
5. Build a rich and diverse menu of experiences when using digital devices and monitor student use of devices as they locate, collect, curate, and evaluate a variety of *digital sources* and organize resources into themes in ways that are coherent and shareable to multiple audiences. (resource 2)
6. Engage in positive, safe, legal, and ethical behavior when using technology, including social interactions online or when using networked devices. Use digital devices in a healthy way acquiring skills and lifelong habits that will promote digital citizenship. (resource 2)
7. Foster online safety in the use of digital devices and media; discuss the benefits and risks. (resource 1 & 3)

8. Set clear, consistent, and realistic expectations for students when using digital devices. (resource 3)
9. Provide guidance about the importance of being respectful in their digital and social interactions. Encourage positive behavior that does <u>not</u> intimidate, bully, harass, or embarrass others. (resource 1)
10. Maintain individual privacy and do not reveal personal addresses, phone numbers, social networking identities, or other personal information including passwords. (resource 1)

Student and parent use of digital devices at home:

1. Set clear, consistent, and realistic expectations for your children related to digital device and media use. (resource 3)
2. Monitor the use of digital devices, including how much time to spend on websites and social media. (resource 4 & 6)
3. Use reputable educational organizations and parenting websites for recommendations and reviews on videos, games, and educational apps that are optimal for the child's age and stage that can support learning at home. (resource 3)
4. Set up a learning workspace for learning and eliminate things that will cause distractions. (resource 4)
5. Help your child balance their time with digital devices, including getting outdoors and having face-to-face social time. (resource 6)
6. Create rules for sharing Internet connection, bandwidth, and digital devices if parents are working from home and students learning from home. (resource 4)
7. Foster online safety in the use of digital devices, media, and social media considering the benefits and risks. (resource 1 & 3)

<u>Resources</u>:
1. Internet Safety, VDOE, https://www.doe.virginia.gov/support/safety_crisis_management/internet_safety/index.shtml
2. Digital Learning Standards of Learning for Virginia, VDOE, October 2020 https://www.doe.virginia.gov/support/technology/standards/index.shtml and https://www.doe.virginia.gov/testing/sol/standards_docs/computer_technology/index.shtml
3. Family Digital Wellness Guide; Boston Children's Hospital, 2020 https://cmch.tv/wp-content/uploads/Family-Digital-Wellness-Guide.pdf
4. Screens in School Action Network: The Toolkit Download, https://commercialfreechildhood.org/pf/screens-in-schools-action-kit/
5. Center on Media and Child Health (CMCH), Boston's Children Hospital, https://cmch.tv/
6. Children and Adolescents and Digital Media, American Academy of Pediatrics, https://pediatrics.aappublications.org/content/138/5/e20162593
7. Teacher Digital Learning Guide, US Office of Educational Technology, 2021, https://tech.ed.gov/publications/digital-learning-guide/teacher/
8. Parent and Family Digital Learning Guide, US Office of Educational Technology, 2021, https://tech.ed.gov/publications/digital-learning-guide/parent-family/

9. Belanger, R. E., Akre, C., Berchtold, A., & Michaud, P. (2011). A U-Shaped Association Between Intensity of Internet Use and Adolescent Health. Pediatrics, 127(2), E330-E335. doi:10.1542/peds.2010-1235d
10. Bickham, D. S., Hswen, Y., & Rich, M. (2015). Media use and depression: Exposure, household rules, and symptoms among young adolescents in the USA. International Journal of Public Health, 60(2), 147-155. doi:10.1007/s00038-014-0647-6
11. Media Use in School-Aged Children and Adolescents. Council on Communications and Media. (2016). Pediatrics, 138(5). doi:10.1542/peds.2016-2592
12. Chassiakos, Y. R., Radesky, J, Christakis, D, Moreno, M.A. and Council on Communications and Media. (2016). Children and Adolescents and Digital Media: Technical Report. Pediatrics, 138 (5),e1-e18. DOI: 10.1542/peds.2016-2593. http://pediatrics.aappublications.org/content/138/5/e20162593

Screen Time & Break Frequency

As the use of digital devices in the educational setting continues to rise, it is paramount to consider best practices related to screen or online time and the appropriate use of breaks from technological devices. Concerns related to eye health, good sleep hygiene, and physical considerations point to the importance of finding a balance between healthy screen or online time and other activities. The available research is limited and varies related to providing set time limits for device use among elementary, middle, and high school students. While time limits are suggested, total screen time depends on the child's environment, types of media, and academic engagement. Suggested time limits include, but are not limited to the following.

Ages 2-5 – 1 hour screen time per day
Ages 6+ – 2-3 hours per day for elementary students and 3-4 hours per day for secondary students.

1. Preserve offline experiences with classwork that may include reading, writing, drawing, and/or hands-on activities; make a daily plan and structure the learning day to balance the time spent on digital devices and offline experiences. (resource 1)
2. Take breaks from the screen every 20-30 minutes as research suggests. Rest eyes 15 minutes for every 2 hours of screen time. (multiple resources available; mentioned in resource 3)
3. Be cognizant of text size and the sizes of devices used to access materials to reduce eye strain. (resource 2)
4. Consider monitor positioning (18-24 inches away and at a height looking straight ahead or slightly down to reduce glare). (resource 3)
5. Encourage complete and frequent blinking to reduce discomfort and blurriness. (resource 3)
6. Monitor sleep patterns to ensure screen time is not interfering with children's attainment of adequate sleep. (resource 4)
7. Stop device use 60-90 minutes prior to bedtime. (resource 4)

8. Encourage students to spend at least an hour outside every day to take advantage of natural light and multi-distance focal points to prevent the onset and progression of nearsightedness. (resource 4)
9. Become educated about potential negative effects of excessive screen time in terms of social, emotional, and neurobiological effects and methods to mitigate them. (resource 5)
10. Be aware of potential signs of eye strain tied to screen time such as frequent eye rubbing, squinting, closing one eye to see better. (resource 6)

Resources:

1. AAP: Finding Ways to Keep Children Occupied During These Challenging Times
   https://services.aap.org/en/news-room/news-releases/aap/2020/aap-finding-ways-to-keep-children-occupied-during-these-challenging-times/
2. Perkins School for the Blind: Getting to 1M: Understanding Getting to 1M: Understanding Magnification and Print Size
   https://www.pathstoliteracy.org/sites/pathstoliteracy.perkinsdev1.org/files/uploaded-files/getting_to_1m.pdf
3. Computers, Digital Devices and Eye Strain (American Academy of Ophthalmology website) https://www.aao.org/eye-health/tips-prevention/computer-usage
4. Edutopia: Pediatricians on Balancing Screen Time, Sleep, and Family During Coronavirus https://www.edutopia.org/article/pediatricians-balancing-screen-time-sleep-and-family-during-coronavirus
5. Psychology Today: Screen Time: The Impact on Kids and Parenting
   https://www.psychologytoday.com/us/blog/helping-kids-cope/201808/screen-time-the-impact-kids-and-parenting
6. The Cooper Institute: The Impact of Virtual Learning on Children's Vision
   https://fitnessgram.net/impact-of-virtual-learning-on-childrens-vision/
7. American Academy of Pediatrics,
   https://pediatrics.aappublications.org/content/138/5/e20162593
8. Teacher Digital Learning Guide, US Office of Educational Technology, 2021,
   https://tech.ed.gov/publications/digital-learning-guide/teacher/
9. Parent and Family Digital Learning Guide, US Office of Educational Technology, 2021,
   https://tech.ed.gov/publications/digital-learning-guide/parent-family/
10. Ask the Experts: Eyes on Screens: Maintaining your Kids' Ocular Health in a Digital World, https://www.youtube.com/watch?v=dfMVRgkx9dI&t=77s

Ergonomics & Posture
Ergonomics is the study of the relationship between people, their work tasks, and their physical work environment. Drawing from a variety of disciplines, it applies designs and practices to optimize the interaction between the person and the work environment. For example, without proper ergonomics, the use of digital devices could impact the body alignment and result in physical symptoms such as neck or back pain, wrist discomfort, or headaches. Prolonged use of digital devices without consideration for ergonomics could then lead to disengagement or poor performance. Therefore, the goal of ergonomics is to improve comfort, safety, and quality of the environment and items that children use during the learning process. The following best practices

are recommended for educators to consider in their classroom design and daily routines, both in-person and virtual when digital devices are being used, as well as for parents and guardians in providing and monitoring good ergonomics in the homework environment.

Posture and Positioning:

Posture and positioning during virtual instruction include placing the device on a table at the correct height and distance for easy use, sitting in a chair with a back, and positioning the feet on the floor in order to maintain correct posture. Specific ergonomics considerations include:

1. Maintain good posture when working at the keyboard. Utilize a chair with back support (resource 1 and 2)
2. Keep feet supported on the floor or on a footrest when working to reduce pressure on the lower back. (resources 1 and 2)
3. Avoid twisting or bending the upper body or neck. Frequently used items should be positioned directly in front of you to prevent injury from twisting or overreaching. (multiple resources: 1, 2, 5, 6)
4. Keep shoulders relaxed with elbows close to your side.(multiple resources: 1, 2, 6)
5. Avoid resting your elbows on the hard surface or edge of your table. (multiple resources 1, 2, 3)
6. Position elbows at 100 to 110 degrees when working to keep a relaxed position at the keyboard. This could require a slight negative tilt (front of keyboard higher than back) when working in upright positions. If reclined in your chair, the keyboard could be at a positive angle to maintain this relaxed position. (resource 3)
7. Position wrists in a neutral or straight position when keying or using a pointing device or calculator. Wrist rests can assist you in maintaining a neutral position when used properly during pauses. Float your arms above the keyboard and wrist rest when keying. Avoid planting your wrists on the table or wrist rest. This can result in bending the wrists either up and down or side to side and result in injury over time. (resource 3)
8. Avoid routine use of non-prescribed medications or use of a wrist brace without the advice of a medical professional. Slight changes made early can avoid future complications. (resource 3)

Environment:

Environment for use of digital devices should include a workspace with proper lighting and needed items such as digital devices, classroom materials, etc., within easy reach. Specific ergonomics considerations include:

1. Work in well-lit spaces and position monitors using screen filters to reduce glare as needed. (multiple resources 1, 2, 3, 6, 8)
2. Avoid excessive reaching. The keyboard and school/class materials should be within easy reach. (multiple resources 2, 3, 5)
3. Position the digital device monitor so that the viewed part of the screen allows you to keep your neck in a neutral or straight position. The monitor should be centered directly in front of you. The top of the computer screen should be slightly below the top of your head, so that you are looking at it with a slightly downward gaze.(resource 3)

4. Adjust the font size, contrast, or color to maximize comfort and efficiency. (resource 1, 3, 8)

Movement and Activity:

Movement is important to keep the learner engaged. Develop a routine within a typical school day that allows for water breaks (hydration) and incorporates movement in activities such as stretching, mindfulness, or other types of brain break activities into virtual learning.

1. Take breaks and include physical movement; these breaks can be brief and should include stretches for optimal results. Every few hours, get up, move around, and do an alternative activity. If possible, take a one- or two-minute break every 15 to 20 minutes, or a five-minute break every hour. (multiple resources: 2, 7, 8)
2. Participate in intermittent movement or activity to promote blood flow and improve alertness and student engagement. Aerobic exercise and other movement will help to sustain strength, improve cardiovascular conditioning, and counteract the strain of sedentary computer use. (multiple resources: 1, 2, 7, 8)
3. Utilize brain breaks or planned learning activity shifts to mobilize different networks of the brain, allowing children to restore focus and improve cognitive processes such as memory, attention, and motivation. (multiple resources: 4, 7, 8)

Resources:
1. 9 Tips for a Healthy Ergonomic Workstation, Mayo Clinic video, https://www.youtube.com/watch?v=K88q_oEwRS8
2. Tech Neck, How Technology is Affecting your Posture, 05-31-19, Neck Pain, Physical Therapy Work Rehab, https://www.ivyrehab.com/news/tech-neck-how-technology-is-affecting-your-posture/ Tech-neck: Impact of technology on posture
3. Ergonomic Tips for Computer Users, University of Pittsburgh, https://www.ehs.pitt.edu/workplace/ergonomics/computer-users
4. How much screen time is too much?, Cleveland Clinic video, https://www.youtube.com/watch?v=R_jikJ8btCE&feature=youtu.be
5. How to Set Up a Comfortable Virtual Learning Workspace for Kids, Cleveland Clinic video, https://www.youtube.com/watch?v=1LMsjMtno8Q&feature=emb_title
6. How to Create an Ergonomic Space for Your Child's Virtual Learning Experience, Jill A. Chafin, September 11, 2020, https://www.lifesavvy.com/37845/how-to-create-an-ergonomic-space-for-your-childs-virtual-learning-experience/
7. The Danger of Sitting: Why Sitting is the New Smoking, Better Health Channel, https://www.betterhealth.vic.gov.au/health/healthyliving/the-dangers-of-sitting?viewAsPdf=true
8. Children and Adolescents and Digital Media, Yolanda (Linda) Reid Chassiakos, Jenny Radesky, Dimitri Christakis, Megan A. Moreno, Corinn Cross and COUNCIL ON COMMUNICATIONS AND MEDIA Pediatrics November 2016, 138 (5) e20162593; DOI: https://doi.org/10.1542/peds.2016-2593