

Wilmette District 39
Community Review Committee

**Mobile Learning in Grades K-4
School Year 2019-2020**

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Katie Lee - Administrator for Curriculum &
Instruction
Elena Ryan - Harper
Lindsay Shea - Central
Alicia Weichert – Romona

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Executive Summary

A. Background

The purpose of the Community Review Committee (CRC) is to “advise the Board on specific strategies that help fulfill District 39’s mission.”¹ District 39’s mission is to “nurture, guide, and challenge students to become creative thinkers, collaborators, and socially responsible, compassionate, and productive citizens of a global society [by providing] an environment that supports the academic, social-emotional, and physical well-being of each student.”² To achieve this, the CRC chose to research the topic of “Mobile Learning in K-4”, investigating the practices used within the district as well as exploring methodologies in use by other school systems. The purpose of this report is to present current research on technology programs in K-4, particularly their impact on students and the characteristics of districts that have successfully implemented technology programs. Finally, the report offers recommendations for District 39 in regards to our K-4 mobile learning program. Our recommendations seek to ensure that all District 39 students are prepared with the knowledge, skills, and competencies they need to succeed in the 21st –Century.

This choice of the topic of mobile learning was the result of concerns from school district administrators regarding a lack of access to digital learning opportunities in grades K-4. Currently, District 39 teachers and students have access to shared devices via carts and there is often more need than availability. As a result, teachers are not able to predict whether they will have access to the cart with enough advance planning to proactively create lesson plans and differentiate learning utilizing the devices. Also, the devices are used for student assessments and since there are not enough devices for students to use simultaneously, major assessments windows are extended. Hence, the district has been weighing the move to a 1:1 program in K-4. While a 1:1 program often implies that devices are assigned to students for use at school and home, it can also mean that a device is available for each student at school only.

The district requested the topic of mobile learning as they desire a more intentional approach to the use of devices for these grades. In addition, this topic is a nice follow-up from the 2017-2018 CRC report, “Differentiation and Personalized Learning”, as a purposeful and robust approach to digital learning will facilitate these initiatives.

¹http://www.wilmette39.org/UserFiles/Servers/Server_360846/File/About%20D39/CRC/CRC%20Bylaws%202016.pdf

²<http://www.wilmette39.org/cms/one.aspx?portalid=360930&pageid=845727>

B. Process

The CRC divided into two subcommittees with one that focused on researching 1:1 technology programs and best-practices (chaired by Michelle Coffey and Sarah Leahy) and another that focused on current technology integration in District 39 and neighboring school districts (chaired by Amy Poehling). The research was collected from reputable and relevant scholarly sources, surveys to District 39 teachers and neighboring school districts, and site visits to local schools. In addition, we met with a local organization, Leap Innovations, who shared their experience with helping over 120+ schools personalize learning with the help of technology.

C. Findings and Conclusions

To thoroughly understand technology in the elementary classroom, we went to great lengths to understand both the potential benefits and drawbacks of technology programs in K-4. Our findings demonstrate that elementary schools employing a 1:1 student-device ratio reveal significant opportunities for improving educational experiences that connect to 21st century learning.

A year-long analysis of research, surveys, interviews and on-site visits led us to the following conclusions:

1. **Technology can significantly improve teaching and learning.** While face-to-face learning remains fundamental to elementary education, online tools can help teachers individualize learning, deepen student understanding, and increase student engagement and achievement.
2. **Schools must incorporate technology into daily teaching to realize the full benefits.** Technology can be used to support learning, especially when available on a part-time basis, but it can also be used in ways that transform learning. And it is far more likely to be transformational when it is used regularly.
3. **Not all uses of technology are created equally.** Some ways of using technology are more valuable than others. The best applications of educational technology will deepen student learning, prioritize higher-order thinking, and foster 21st-century skills.
4. **Regular, quality professional development is fundamental** in preparing teachers to continue the work of change through technology. A teacher's understanding and comfort level with technology is foundational to successful classroom use of technology.
5. **Communication is vital.** Successful districts have been proactive in terms of communicating with parents, students, and community members regarding the transition to 1:1 educational technology.

Overall, the CRC finds that 1:1 technology implementation will have significant benefits for the district. More importantly, our research suggests it will enhance student learning and deepen (rather than replace) traditional modes of teaching.

D. Recommendations for Action

Technology initiatives require the careful planning of schools and districts to foster and accommodate change. The recommendations in this reports highlights the ways our district can foster an environment that enables 1:1 technology programs to enhance learning.

The CRC recommends the following:

1. District 39 should increase access to technology so that every student has access to one device that can be used in homeroom classrooms as well as specials classes, with consistency across grade levels.
2. District 39 should advocate for a balanced approach to technology use in the classroom, supporting a blend of traditional and innovative modes of teaching.
3. District 39 should provide in-depth professional development in advance of technology implementation, and in an ongoing manner.
4. District 39 should ensure that technology use in the classroom enhances instruction and emphasizes the 4 C's of modern education and higher-order thinking.
5. District 39 should become a thought-leader in the field of health and wellness as related to technology use, with an emphasis on physiological as well as social-emotional health.
6. District 39 should define a statement of philosophy about the use of technology in the classroom to provide a district-wide purpose and unifying goals.
7. District 39 should formulate a robust communication plan for any new technology initiative: specifically, a plan that includes parents, students, teachers, and administrators.
8. District 39 should develop (or follow an established) vetting process for educational “apps” and programs, while also establishing a system to continually re-evaluate the effectiveness of technology-based programs used in the classroom.

Research Summaries and Strategic Recommendations

After its year-long study on mobile learning, the CRC makes the following recommendations to improve the teaching and learning in District 39 and to help the district fulfill its commitment to creating a supportive learning environment for all of its students:

1. D39 should increase access to technology so that every student has access to one device that can be used in homeroom classrooms as well as specials classes, with consistency across grade levels.

Feedback from teachers in our district and nearby districts emphasizes a general consensus that 1:1 technology would be useful in our classrooms. CRC conducted several surveys to gather data from the following:

- Current D39 K-3rd-grade teachers about current access to technology and how it could be improved
- Current D39 4th-grade teachers about their experience piloting 1:1 Chromebook use this year
- New Trier feeder districts
- Other local peer districts (Glenview, Huntley, Deerfield, Skokie, Prospect Heights)

Results from Survey

Survey results revealed the following drawbacks of the shared cart system currently in place in D39:

- Of those surveyed, only 20.6% of K-3 teachers reported that they can always get devices when they need them.
- Survey responses indicated that devices are used mainly by those who store the carts in their classrooms. Teachers without carts, often specialist teachers, have less access to technology.
- The carts themselves are difficult to move across long distances: for example, from one end of the building to another. Without elevators, the carts also cannot be transferred between floors. This leads to less flexibility in cart sharing.
- There are issues with availability on high-volume days/times. Carts are in high demand during WIN time, and under extreme demand during standardized testing. The testing process can take longer as a result.

Survey results revealed these benefits of a 1:1 system:

- Lesson plans can regularly include technology, as it benefits the students. One teacher emphasizes, “If I could reliably source the equipment, I would plan to integrate technology more frequently.” Another teacher offers a similar comment: “Having access to technology without needing to check it out would allow for a more natural and seamless integration with day-to-day instruction.” Many teachers are looking for technology to be integrated into their day, rather than existing as a “special event.”
- Access to 1:1 technology offers the potential of improved teaching methodologies. One teacher argues that with 1:1 technology, “My teaching methods would change and the kids would have easier, faster ways to access materials, research, and activities.” Equitable access to information, for all students, remains a goal in line with the objectives of D39.
- Teachers and students save time with a 1:1 system. Currently, students have to log into devices every time they are used. When signing into Google Classroom and similar applications, this process can take time when multiplied by numerous logins throughout the day. Avoiding the physical task of moving carts also saves time for instructors.
- Particularly for the older grades, teachers reported that executive functioning can increase with 1:1 technology use. Students are able to “take more detailed notes, utilize the camera to augment information, and also use the calendar and notes function to keep themselves on task.”

Research from academic sources likewise indicates strong reasons for implementing 1:1 technology.

Building on the [2017-2018 CRC report on personalized learning](#), the committee finds a correlation between 1:1 technology implementation and successful differentiation in the classroom. It is well established that personalized learning is essential to K-4 instruction. However, individualizing content can be challenging for a teacher in a classroom of 20+ students.

The International Society for Technology in Education (ISTE) argues that “while one-on-one instruction geared toward the strengths and challenges of each student has always been an ideal, only in recent years have technological advances allowed it to become a reality in public education” (Howton, 2017). X`

In the past, large class sizes, late or absent interventional responses, and a lack of student data have prevented school leaders from being able to offer personalized learning at an optimum level. 1:1 technology overcomes many of these barriers. Individual tablet use, for example, helps teachers and administrators monitor student progress, while also providing alerts for necessary interventions. Tablet use also helps teachers communicate with parents directly via

apps/programs that offer continual use between home and school (Howton, 2017). In short, 1:1 technology facilitates personalized learning.

Recent studies point to the concrete benefits of 1:1 technology:

- According to the *Journal of Technology, Learning, and Assessment*, 1:1 technology implementation results in greater teacher-student collaboration around instructional tasks (Weston & Bain, 2010).
- The *Journal of Technology, Learning, and Assessment* likewise found that teacher practices generally changed to accommodate the opportunities of increased technology access in a 1:1 setting, leading to more problem-based or project-based learning activities (Shapley, 2010).
- According to the International Society for Technology in Education (ISTE), successful personalized learning “involves the student in the creation of the learning activities and relies heavily on a student’s personal interests and innate curiosity.” Offering a 1:1 technology environment helps to promote a student-centered classroom with a focus on action and creation (Bayse, 2018).
- In fact, several studies indicate the importance of motivation and curiosity to drive student learning (Norquist, 2016; Ciampa, 2014). Implementing 1:1 technology provides many ways to “tap into” student interest and provide more tailored learning opportunities.

While technology use, including but not limited to 1:1 implementation, should not be touted as unequivocally positive, it is the recommendation of this committee that 1:1 implementation will offer key benefits to the district.

2. D39 should advocate for a balanced approach to technology use in the classroom, supporting a blend of traditional and innovative modes of teaching.

Based on research conducted this year, the CRC suggests the idea of a balance between traditional and technological modes of learning.

One resource for this recommendation is the **2018 Cambridge Assessment Report**, a study conducted by Cambridge Assessment International Education. The study is based on survey responses collected from 10,209 teachers and 9,397 students (ages 12-19) worldwide. More than 100 countries participated in the survey, including the U.S., China, and India. While the Cambridge Assessment study focuses on the activities of older students, it remains a useful study of educational trends and expectations for 21st-century students.

Cambridge Assessment came to the conclusion that: “The challenge for schools is to look at how technology can support learning, rather than lead or replace it” (6). Cambridge emphasizes that

current high school practices reflect this delicate balance. Their study found that 48% of students report using technology in classrooms, yet 90% of students also report the use of “pen and paper during lessons” (15). An additional 73% of students report using whiteboards and/or chalkboards during lessons.

Similarly, for homework, 65% of students report doing work on a laptop; yet, at the same time, 98% “say they still use pen and paper” (6). These findings suggest that a working relationship between “pen and paper” and modern technologies already exists in the 21st-century classroom; furthermore, the Cambridge Assessment team supports this mixture of approaches.

Another recent study indicated that reading on a tablet allowed students to “actively shift between reading, processing, and thinking about content,” which extends the cognitive process in comparison to reading a traditional text (Bergeson & Rosheim, 2018). However, the study concluded that “foundational literacy instruction” remains imperative. Technology can provide a cost-effective tool to support personalized learning in reading, but it cannot replace in-person instruction.

At the heart of this issue is whether technology use in the classroom will supplant student ingenuity and human interactions. The overwhelming majority of experts in this field caution balance. Technology implementation on a 1:1 level provides significant benefits to teachers and students. However, technology cannot - and should not - replace personal instruction and other traditional modes of learning.

While 1:1 initiatives often mean devices are assigned to students for use at school and home, it can also mean that a device is available for each student *exclusively* at school. Such a limitation would be appropriate for younger (K-2) students.

3. Technology use in the classroom should enhance instruction, emphasizing the 4 C’s of modern education and higher-order thinking.

In recent years we have seen our District 39 classrooms benefit from the implementation of the 4 C’s: Critical Thinking, Communication, Collaboration, and Creativity. After examining the demands facing 21st-century students, the **National Education Association (NEA)** established this key set of skills that students will need to survive in the modern world. Much like a sketchpad or thinking map, technology becomes a tool for exploration and achievement with this set of skills. Through our CRC site visits, we learned that technology in the classroom can improve the effectiveness of the teacher and the efficiency in the classroom.

The question we often ask as we navigate technology’s connection to the 4 C’s is “how does this enhance the learning experience and create engagement for learning?” Some of the strongest sources we reviewed made the point that technology use in the classroom must enhance instruction, rather than simply change the delivery method. A common method for teacher reflection in this area is the **Substitution Augmentation Modification Redefinition (SAMR)**

method. With our goal being to achieve higher-order thinking through technology, we would look to focus on how technology can be used to augment, modify, and redefine a learning experience.

Collaboration is one of the 4 C's that comes to life in a whole new way when achieved through the use of technology. Collaborative powerpoint projects, peer editing, and joint online research are just a few tools that become available to us when technology and collaboration combine. Jade Davis, an expert in emerging technologies and Director of Digital Project Management at **Columbia University**, cautioned that "learning is a collaborative process...when you take away the ability for people to make things together, I think you lose something" (Kamenetz & Feinberg, 2018). This quote emphasizes the importance of collaboration being part of the learning experience and a skill for students to develop as they grow. Davis echoes some of the concerns of Cambridge Assessment in suggesting that student-to-student interactions are a critical component to learning. Through the collaboration tools that technology offers, we are able to expose students to a new type of peer interaction. Students not only work in person with a partner but also research and create the project at the same time. It is side-by-side learning that is engaging for all students and ends with a collaborative product that is a true representation of teamwork.

Our recommendation connects strongly to building critical thinking and higher order thinking skills in our students. Information from the **University of Connecticut** states that "higher-order thinking skills go beyond basic observation of facts and memorization. They are what we are talking about when we want our students to be evaluative, creative and innovative" (Univ. of Connecticut, 2018). Higher-order thinking skills are supported by **Bloom's Taxonomy of Thinking Skills**, widely used by educators, which prioritizes evaluation, synthesis, and creative generation as the top priority of educators. Using technology in the classroom should build on these higher-order skills, rather than reinforcing "skill and drill" types of learning.

Finally, a quick example: a grade school in Kansas, highlighted in *Ed Tech* magazine, organizes a "Genius Hour" in which students come up with creative solutions for real-world problems. During this hour, students "are able to use video tools to talk with experts about their ideas." One fifth-grade class was able to "conference with a prosthetics expert after engineering prosthetic tails for injured dolphins" (Zimmerman 2018). These are the kinds of opportunities D39 should strive to take advantage of to deepen learning and high-order thinking through technology use.

4. D39 should define a statement of philosophy about the use of technology in the classroom to provide a district-wide purpose and unifying goals.

Our research indicates that successful implementation of 1:1 technology requires a clear "technology vision" or statement of philosophy - set by the school administration - that outlines the goals and purpose(s) of technology use in the classroom. The existence of such a philosophy

is the first step in garnering acceptance and approval from parents, teachers, and community members. Likewise, as technology changes are implemented, a shared vision helps guide teachers in their day-to-day planning and instruction.

James Tenbusch, a long-time Illinois superintendent, reviewed seven long-term research studies examining the educational outcomes of 1:1 technology use. He found that “significant educational benefits” were reported only at schools where a “transformational vision of 1:1 computing” existed among key central office and building level administrators (Tenbusch, 2011). Without this clarity of purpose from the administration, such “educational benefits” are less likely to emerge.

Ted Brodheim, former Chief Information Officer for the New York City Department of Education, similarly writes: “Instituting a technology vision committee can help school districts determine where to invest time, and help to identify potential challenges both in, and out of, the classroom” (Brodheim, 2016). Brodheim suggests that a “technology vision committee” can ultimately save time, for teachers and administrators, as well as prevent roadblocks during the implementation process.

We suggest that D39 formulate a forward-thinking “vision statement” for technology, which can be distributed and discussed well in advance of technology implementation in the classroom.

5. D39 should provide in-depth professional development in advance of technology implementation, and in an ongoing manner.

One of the most important findings of the committee was that professional development is key to a successful transition to 1:1 technology. In particular, several sources noted that **tiered training** is the most effective way to begin training teachers on new technology.

Andrew Marcinek (2015) writes that “professional development should be tiered by experience level. Differentiating your professional development will create happy teachers and increase the acceptance of the device or tool being displayed.” Many teachers noted feeling frustrated at training sessions that were either above or below, their skill level. With tiered training, administrators are more likely to see motivated teachers ready to take on new technology.

Brodheim (2016) also suggests that “students won’t improve learning outcomes unless your school provides **continuous professional development** and training for educators about how to use the device to effectively teach students.” In other words, teachers and students reach a lull in their learning if professional development does not continue over time.

Brodheim cites a study by TES Global, which found that “45 percent of teachers reported they didn’t believe that their professional development programs prepared them to assess or use technology in their classrooms.” Given statistics such as these, it is worth taking concentrated

effort to ensure that D39's professional development choices align with teacher needs/preferences.

In surveys conducted by the CRC, we found that 72% of teachers surveyed indicated **Institute Days as the preferred method** for professional development, while only 1.9% reported outside professionals as desired. Our teachers, then, prefer to be trained by IT staff that they know. This also deepens their connection to the district.

Nick Sutton, superintendent of Stark County Schools in Illinois and contributing writer at *Edutopia*, argues there are "more positive outcomes when schools focus on **training and immersion** rather than just implementation with one-to-one initiatives."

Sutton's message is simple: the implementation of a technology program or device is not enough. It is the training and "immersion" into a technological vision that ultimately matters. Getting teachers and community members to "buy into" a vision is the first step. The next step is training: continuous, tiered, and district-appropriate training for all those involved in technology implementation.

6. D39 should become a thought-leader in the field of health and wellness as related to technology use, with an emphasis on physiological as well as social-emotional health.

The CRC believes that health and wellness, in regards to technology use, will be a significant concern for parents in our district. That being the case, we feel that D39 has the unique opportunity to become a thought-leader in this field. Not many other districts have emphasized this aspect of tech use in their rollout years.

The American Academy of Pediatrics (AAP) is reluctant to state a specific amount of "screen time" advisable for school-aged children.[1] Their emphasis, rather, is on the *quality* of the time spent using media. The AAP prioritizes high-quality programming, as well as opportunities for children to be active while using electronics. Our research indicates that school-aged children should not exceed more than 60 minutes of *continuous* electronic use; further, it is generally recommended that students have breaks every 20 minutes for vision purposes.

Of the 4th grade teachers surveyed who are currently piloting the use of 1:1 Chromebooks, 87.5% report students using them 30-60 minutes a day with 12.5% reporting 1-2 hours of use per day. These time limits are within the bounds of current pediatric recommendations, provided that students have adequate breaks and opportunities for physical activity.

The following "classroom recommendations" are based on research studies and scholarly sources, as well as consultations with a Wilmette-based pediatrician, a chiropractor, and a local eye doctor.

Medical Issues and Device Use

If not used responsibly, there can be physical and mental ailments associated with extended technology use. It is prudent to discuss these issues to help determine best practices when using devices at school. It's important to note that the health impacts of school-based devices need to be thought about in conjunction with personal device use such as televisions, cell phones, and gaming systems. Although there can be some variances depending on the mobility/utility of the device, we need to monitor all ways that children are using technology over the course of their entire day.

Vision

Colors of light can impact a child's brain. Blue light has been identified as impactful on eye and mind health. Blue light has shorter wavelengths than other colors on the visible spectrum, moving faster and having more energy. Some blue light waves during the daytime hours are fine and may even have positive effects like increased attention or reaction time. However, it is a concern with excessive blue light exposure and its use in the evening and night hours. Electronic screens that give off cooler colors like blue can impact a child's ability to sleep and contribute to unhealthy conditions. The circadian rhythm of a child gets interrupted with excess exposure to blue light right thus impacting sleep. In addition, blue light can suppress the secretion of melatonin, which would have signaled the body to fall asleep.

There are embedded features inside some devices that can help control the cooler colors produced by electronic screens. Particularly for evening or night hours, the "Night Shift" feature on an iPad for instance, can be set for colors to be "More Warm", thus lessening the amount of blue light. These settings can be scheduled for automatic use based on time. Blue screen filters can also be purchased and applied to assist in lessening the amount of blue that is given off. A less practical suggestion, but one that would work nonetheless, would be to purchase blue blocking glasses to be worn while using electronic devices.

Another way to help healthy sleep cycles is lots of exposure to bright light during the day, which will help a child's body to sleep at night. If a device must be used at night, another strategy is to be sure ambient light in the room is warm will help to offset the amount of blue light making in in the eye.

Another issue with eyes and children is eye-strain, blurred vision, and headaches. Images on screens flicker. Some experts believe that this flickering impacts our eyes ability to focus, thus placing strain on them. This can be helped by limiting the amount of continuous use of screen time. Breaks should be built in to equally have as much non-screen time as screen time. A balance must be struck and time away from the screen should be consciously built in. Another balance to strike is close versus far sight. After close up use of a device, it is beneficial to look at something further away for a period of time.

Classroom Recommendations:

- Limit blue light exposure particularly during evening hours
- If the school device goes home, do not allow the device in the bedroom during the evening or late at night
- Conduct regular breaks so that there is not extended screen use
- Equal use of eBooks and paper books will help balanced time on and off the screen
- Balance looking at objects close and far

Weight

Screen time needs to be limited for more reasons than eye care and sleep disruption. We need to keep watch on how devices impact physical activity. Lower activity levels can impact health (Maher, et al., 2012). One study indicated that more time in front of screens is a strong indicator of weight status, especially in boys (De Jong, et al., 2013). Another study found that this was true for television use, but with computers, it was not significantly associated with overweight status. In drawing a potential conclusion from this study, a traditional tv typically stays in one location and is one directional. Computers and mobile devices can move with the person and can be interactive in play, requiring movement. It may not be the device itself but how the device gets used. For instance, a tablet like an iPad can be easily moved around with the student while working thus making it more compatible with higher activity levels. When choosing a device for use with younger children, smaller size and less weight may lend itself well for increased physical movement.

Some health professionals have also noted the type of advertising targeted to young children on electronic devices. Exposure to advertising containing sugary drinks, fast food, and candy could also contribute to the decisions that are made by children when selecting food. If those become a desired and preferred snacking option, the weight will increase.

Classroom Recommendations:

- If using a stationary screen, make sure there are movement breaks at least every hour
- Consider devices that are smaller in size and weigh less to increase the chance of physical movement
- Monitor advertising targeted toward children, limit it when possible
- Provide opportunities for physical movement by building into the day non-screen, physical games and exercise
- When possible, select electronic games that require movement to play

Ergonomics

“Tech neck” is a term coined to describe the bending of the neck for a long amount of time due to increased technology use (Mesquita, Gema, Reimão, & Rubens, 2007). Neck and shoulder pain are noted as a result of this bending. The muscles have to strain for the head to be held. Ways to prevent pain is to take breaks and move around. This puts the neck back in its regular

position and gets the blood flowing naturally. Another way to help is to lean back while sitting down. This takes the strain off the neck. Working while standing is yet another way to prevent the neck from bending.

Hakala's et al. (2010) study found the following:

“There is evidence that musculoskeletal symptoms can be reduced through an ergonomics approach and through education. Among young people and adolescents, 6th grade children who reported not having furniture specifically designed for computer use were more likely to have musculoskeletal discomfort than those who had.”

Touch typing and "hunting and pecking" have different postures: touch typists sit upright; eyes on the screen (Grayson, 2009). Those who hunt and peck tend to be hunched over, looking down at the keys. When typing, children should be encouraged to use school taught keyboarding skills for best posture.

Classroom Recommendations:

- Incorporate training on how to use devices in an ergonomically correct way
- Conduct frequent short breaks from devices to reduce musculoskeletal discomfort and to reduce complaints later of these areas
- Provide education for parents on specific areas/furniture designated for device use
- Teach and practice proper keyboarding skills and posture

Hearing

As we assign digital projects that incorporate sound elements, we will need to monitor how long and loud students are listening to audio. The goal is to make sure no permanent damage comes to the ears. Because earbuds can be lodged in the ear tightly, hearing can be put at risk with high volume levels. Some warning signs that sound is too loud is if it can be heard by others or if the volume is over 50% ("Turn down", 2013). Staff will need to monitor sound levels particularly with younger children and educate them on the dangers of noise-induced hearing loss. Although earbuds are affordable, a better choice may be headphones. Headphones that fit well, may not need the student to increase the volume if the sound is clear. If headphones are purchased and shared, they would need to be of a material that can be cleaned regularly.

Classroom Recommendations:

- When possible use headphones that sit outside the ear instead of earbuds which don't allow any noise to escape
- Purchase kid-safe headphones which have lower maximum volume levels or an ability to limit the volume
- Listening breaks should be at least once per hour

- Monitor students by listening while walking by and if you can hear it, that is a sign that the volume is too loud

Mental Health

A rising concern among parents of teens and older students is the link between technology use and mental health. Research in this field is forthcoming, and D39 should continually monitor the field for new studies and insights.

Currently, the American Academy of Pediatrics argues: “Research has suggested a U-shaped relationship between Internet use and depression, with increased risks of depression at both the high and low ends of Internet use” (AAP, 2016). In other words, there are risks at both ends of the spectrum: frequent use, and infrequent use. The simple use of electronic devices, especially in the classroom, has no definite link to depression. Yet, there are potential risks of “high” levels of Internet use that D39 should continue to monitor.

It must be emphasized that the AAP and other academic sources typically examine the link between social media and mental health; therefore, there is less data on how school-based uses of technology might affect mental health.

One problem that can affect students using devices at school is technology addiction. In a study by Rugai and Hamilton-Ekeke (2016), it stated that “digital addiction” is used to describe someone who uses technology so much that it has a negative impact on their wellbeing and absorbs all their attention. The study also states, “kids can get a natural high when logging onto the Internet and when playing the latest video game, or instant-messaging with their friends.” This behavior can become compulsive as children try to get the next “digital boost”. The authors note that digital addiction has many negative side effects including: interference with sleep, headaches, body pain, fatigue, and cyber-bullying.

Given these concerns, amid an emerging field of research, the CRC proposes the following Classroom Recommendations:

- Age appropriate digital health and safety instruction within a “digital citizenship” curriculum framework
- Education should include technology addiction and how to recognize the signs
- Limitations on screen time and opportunities for in-person social interaction
- Monitor what is being done on devices through in-person and electronic means

Physical and mental health must be considered when selecting a device and designing a mobile learning environment. Recent recommendations from the American Academy of Pediatrics for children 6 years and older is to place consistent time limits on media, the type of media, and make sure media does not take the place of adequate sleep, physical activity and other behaviors

essential to health (AAP, 2015). If a balanced approach is taken, medical ailments can be avoided.

A final note: the CRC recommends that D39 strives proactively to educate parents so that proper technology use is balanced throughout a child's entire day, both at home and at school.

7. D39 should formulate a robust communication plan for any new technology initiative: specifically, a plan that includes parents, students, teachers, and administrators.

This recommendation emerges from a "case study" of the Deerfield school district, conducted by the CRC, based on the belief that this exemplary district is a strong model for D39's technology implementation.

At Deerfield, the Director of Technology & Innovation (Marcie Faust) led the rollout for 1:1 technology in 2015. As part of this rollout plan, Faust developed a robust communication plan for parents, students, and teachers.

Deerfield's Communication Plan and Timeline:

- **Handbook for parents and teachers**
 - Faust developed a handbook, which was distributed one month before the parents' nights at the school.
- **Parent Nights:** Deerfield hosted several "1:1 Celebration Nights" prior to the start of school in the fall. These featured:
 - At least one event for each school involved
 - Presentations by pilot teachers – coming from the teachers is key
 - Presentation by the Technology Director – focused on answering parent questions (Faust surveyed parents beforehand)
 - Follow-up: presentations were published after the event
- **Emails to parents**
 - Conducted at several points during the rollout year
 - The first email aims to collect questions in advance of parent night(s)
- **Professional development for teachers**
 - Deerfield hosted teacher events throughout the summer prior to the rollout year (note: specific teachers had piloted devices already)
 - Faust located PD opportunities in and out of the district, including the Leyden symposium and Northshore Tech Camp webinars.
- **Deployment Day**
 - On the day of distribution, or "deployment day," Faust had a presentation for students that focused on the basics, including how to power, charge, and properly store the device.
 - Faust also prepared a letter/materials for teachers on this day.
- **Partnership with an outside expert** (Deerfield used Devorah Heitner, Ph.D.)

- Heitner presented twice in the fall at Deerfield’s district schools
- She also led transition workshops for students
- **Support for Parents**
 - Provide hands-on technology workshops for the parents in winter & spring
 - Make all presentations available to parents on an ongoing basis
- **Support for Students**
 - Conduct a “boot camp” for students during early implementation
 - Have follow-up sessions for students throughout the year on responsible “digital citizenship”

Other Exemplar School districts include:

- Leyden Township (Chromebooks)
- Maine Township (Chromebooks)

8. D39 should develop (or follow an established) vetting process for educational “apps” and programs, while also establishing a system to continually re-evaluate the effectiveness of technology-based programs used in the classroom.

Research indicates there should be a process in place for selecting which apps/programs are to be used in the classroom. Further, it is essential to have an evaluation system in place prior to implementation.

One trend in current research is a complaint that schools do not have sufficient means of evaluating educational apps and programs. Lubniewski, McArthur, & Harriott (2018) argue that “since this type of technology (i.e. app use) is still relatively new, the rigor with which it is screened before being implemented as an instructional support is generally lacking” (323). Other scholars, including Newton & Dell (2011) and Powell (2014), have noted the same problem: teachers and administrators do not have a sufficiently rigorous way to evaluate so-called “educational” apps.

In response, authors Lubniewski, McArthur, & Harriott (2018) developed what they call the “**App Checklist for Educators**” or ACE. This 1-page checklist, which is meant to be quick and easy to use, is a potential model to follow (see appendix).

The ACE main steps are:

1. Evaluate the age range, cost, content area, and targeted skills.
2. Assess student interest, as well as ease of use for the students.
3. Evaluate design features and ensure a “clear and consistent layout,” which is essential for students with disabilities.
4. Document the connection to the curriculum, including the Common Core standards.

5. Assess the instructional features, including whether the app asks students to memorize facts, explain ideas or concepts, apply information, and/or create original work (ref: Bloom's Taxonomy of Learning). While the needs of each teacher will differ by instructional goals, it is crucial to identify whether the app is calling for lower- or higher-order thinking.

Re-evaluation of Technology

After the technology is in use, the district should establish a system by which it continually evaluates the effectiveness of the device, app, and program use. At Deerfield, the district evaluated the success of 1:1 technology implementation on an ongoing basis with a tool called "BrightBytes Data Collection." Deerfield used BrightBytes to conduct in-depth surveys in the fall and spring of their rollout year.

The goal was two-fold:

- (1) to determine areas of student growth and teacher satisfaction
- (2) to determine areas of weakness and need for professional development

The CRC recommends a similar process by which to assess the strengths and weaknesses of 1:1 implementation during, and after, the rollout process.

Finally, while **device selection** is not a focus of the CRC's strategic recommendations, we did collect some data. Of the teachers surveyed by the CRC, the following preferences were noted:

- 73.4% of teachers surveyed would prefer a tablet with a keyboard (ex. iPad with keyboard case)
- 12.5% would prefer a laptop
- 9.4% would prefer a web-based laptop, such as a Chrome book.

Conclusion

The Community Review Committee undertook a year-long study on the topic of mobile learning in grades K-4. This topic of study was requested by District 39 administrators to ensure that our District continues to meet the needs of our teachers and students. Our research shows that technology implementation on a 1:1 level can provide significant benefits to teachers and students. When used effectively, technology can transform and empower learning without taking away from traditional modes of classroom teaching. 1:1 mobile learning can give learners greater student agency, and provide them with a platform to stimulate curiosity, collaboration and creativity. In short, consistent access to technology will help students develop skills they need to succeed in a rapidly changing world.

The CRC believes that these recommendations will help fulfill our district's mission to nurture, guide, and challenge students to become creative thinkers, collaborators, and socially responsible, compassionate, and productive citizens of a global society.

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[1]The AAP, however, is very clear about screen limits for children ages 2 to 5, which affects our kindergarten population. The recommendation for age 5 is to limit "screen use to 1 hour per day of high-quality programs" (AAP, 2016).