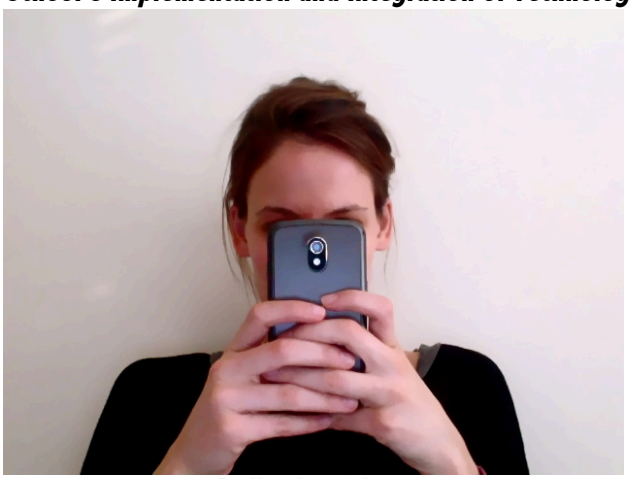
Bring Your Own Device…And Actually Use It!

A Case Study of A School's Implementation and Integration of Technology via BYOD policy



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The Story

"Hello, miss!"

"Good morning, Luis[1]," I greet him at the classroom door at the start of second period. He is wearing the same jeans as yesterday, but with a red and blue striped sweater. "You look nice today!" I compliment him with a smile.

"Thank you, miss." Luis takes a seat and chats *en español con sus amigos en la esquina de la clase*. Luis sits with two other ESOL students in the corner, as they do every day, and they chit-chat throughout class in both *Español* and English.

I have known Luis since September, but he only became a student of mine a month and a half ago. Luis is from El Salvador and came to Herndon Middle School in Herndon, Virginia this school year. At the beginning of the school year, Luis was a Level 1 beginning ESOL student and was taught by a different teacher in the school. I saw him parading down the hall with his pals in between classes one day, and I heard him yell, "¡*No tengo un lapiz*…" hoping a friend would have one to lend him.

"A pencil? I've got one. Come in!" He looks back at me, points to his chest with his finger.

"*Sí, ven conmigo*," I beckon him with a waving motion of my hand into my classroom and give him a pencil.

"Thank you, miss!" Luis has a big, genuine smile on his face.

"You're welcome. Don't lose it now!" I shoo him off to class, hoping he won't be late.

Whether he didn't have a pencil because he lost one, or because he didn't have access to the materials he needs for classes, like a yellow #2, I'm not sure. What I am sure of is that I am extremely proud to know and teach this young man, who in one year jumped from a grade 1 reading and writing level, to a grade 3 level. Next year, he will be moving on to eighth grade, and he will still have much farther to climb to reach grade level. It is for students like Luis that we struggle to find strategies to help close the achievement gap and the digital divide nationally, and at Herndon Middle School.

At Herndon Middle School, we have a Bring Your Own Device (BYOD) policy, which is in place to encourage technology integration in classes[2] without the extreme or extra financial cost. Fairfax County Public Schools has outlined this policy on their website; it is brief and requires just the completion of a permission form, available in nine languages, to allow students to use mobile devices in school:

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[1] A pseudonym has been created for this student to provide anonymity and to protect the student's rights to privacy.

[2] Students have access to Herndon Middle School's free Wi-Fi once permission forms have been completed and turned in, and students have received permission from teachers within individual classes on a daily or per-task basis.

> *"Fairfax County Public Schools is committed to assisting students and staff in creating a 21st century learning environment. In efforts to support this progress, students and staff will now be able to access our wireless network with their personal devices (laptops, netbooks, tablets, smart phones, etc) during the school day. With classroom teacher approval, students may register and use their own devices to access the internet and collaborate with other students. By allowing students to use their own technology on campus we are hoping to increase the access all students have to the technology they need to succeed."*

Beyond this hopeful, albeit brief, script, Fairfax County Public Schools has not yet released any other more specific terms for how to schools and teachers should implement and integrate this BYOD policy, as it was first put in place in 2011. I have underlined important tenets to the policy: that the purpose of the program is to assist in creating a learning environment for 21st century learners, that access will be available via the school's wireless network, that students will use devices with teacher approval, and that the desired outcome is increased access to technology. In a 2012 Fairfax BYOD update, the Fairfax community is informed that "Many students…use their devices to take notes, to complete assignments, to create study tools, and to collaborate with other students." The overall goal of this survey and study is to examine:

- what (if any) access to technology students have at home
- what access to technology students have in school, and how that technology is integrated
- what other ways the BYOD program can be strengthened and more fully embedded into instruction

The Data

At Herndon Middle School, 86 total students from five English classes participated in the technology use survey, which sought to capture a bigger picture of how technology is used by students at Herndon Middle School and at home. These five classes represent three general education 7th grade English classes and two co-taught ESOL 7th grade English classes. To capture a general picture of Herndon Middle School's population, important statistics[3] of the school's general student population are as follows:

- 56.43% of students are enrolled in general education courses, 21.89% of students qualify for English language services, and 17.95% of students qualify for Special Education courses;
- 37.55% of students are White (non-Hispanic), followed by 34.13% of the population as Hispanic;
- 25% of students are limited English proficient; and 42.22% of students qualify for free or reduced fees for meals at school.

Of the students who participated in the survey, the demographics[4] are as follows:

- 37 students are identified as students who qualify for ESOL support services (55.2% of representative population);
- 6 students are identified as students who qualify for Special Education support services (8.9% of representative population);
- Students' free or reduced fees for meals at school status is not released information

While this population is not an accurate representation of Herndon Middle School as a whole, this survey does accurately target the population that our investigation seeks to study, those who are negatively affected by the achievement gap on assessments and by the digital divide. All core content areas set school improvement plan goals this year to close the achievement gap between ESOL students and non-ESOL students, and between students with disabilities (SWD) and non-disabled students. There are still significant gaps between populations, but this year, Herndon Middle School saw all achievement gaps close by some percentage[5].

Of the 86 students who completed the survey, only 67 students correctly completed the entire survey. As such, this study will only represent those 67 students who provided full information on the survey. The survey was comprised of seven questions. The first four sought to determine if students had access to technology at home, what types of devices students had access to, and how often (in hours) students used technology per day. The next three questions asked students about their habits of technology use at school and what their opinion of the current technology at the school was.

First, student responses were sorted into categories according to the question *How often do you use technology?* Surveys were separated into groupings for 0 hours, 1-3 hours, 4-9 hours, 10-18 hours, and (yes) 24 hours a day. Seven students admitted to never using technology, twenty-four students use technology 1-3 hours a day, nineteen students use technology 4-9 hours a day, eight students use technology 10-18 hours a

[3] Demographic information based on information for the 2012-2013 school year on Herndon Middle School's Student Statistics profile, as released by Fairfax County Public Schools.

[4] These statistics describe only the students who completely filled out the survey; interestingly, of the 19 students who incorrectly filled out the survey, 13 students were identified as ESOL, and 1 as SPED. Perhaps language or processing difficulties led to improper completion of the survey.

[5] Due to the variety of factors which likely impacted student achievement on these tests (different teachers, teaching styles, varying uses of technology, assessment types) an additional study would be needed to determine which achievement gaps closed more for which students, content areas, classes, and why.

day, and nine students are convinced they use technology either 24 hours a day or "24/7" as some students wrote. In sorting these groupings, the hope is to see if there is any relation to students' use and/or feelings toward technology at the school based on their frequency of access to it.

Frequency of Technology Use on a Daily Basis (in hours)

0 hours	1-3 hours	4-9 hours	10-18 hours	24 hours
7 students	24 students	19 students	8 students	9 students

Interestingly, of the students who chose 0 hours of use as an option, only two did not have any access to technology at home. The others who chose 0 hours had access to at least one device at home, but do not use that device. For students who chose 24 hours as their frequency of use, students had a range of access to number of devices: on the low end, two students had access one device; on the high end, one student had access to five different devices at home (cell phone, iPad, Kindle, laptop, and desktop computer). There seems to be no pattern or correlation in access at home, number of devices, and number of hours spent daily using technology.

I. Do you use technology in class at HMS? How often do you use technology in class?

This section will help to determine if students use technology frequently in classes at Herndon Middle School. They have outlined the number of hours usually spent using technology a day; this section will help to determine how much of that time is spent on technology at home versus how much of time is spent using technology at school. Students also identify the types of use of technology in school, which will give a clearer picture of technology use to inform recommendations for Herndon Middle School and schools in similar technological and financial situations. Below are selected samples of responses from the first narrative question of the survey with analytical observations that follow.

0 hours – 5 students do not use technology at HMS; 2 students do use technology at HMS.

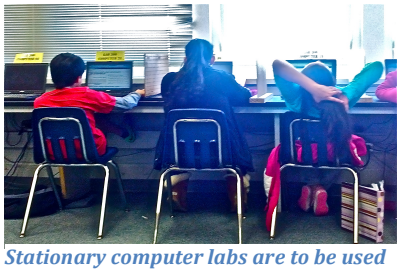
No – 5 students	Yes – 2 students
"No, I don't use my phone in class only if I'm aloud [sic] to, but (only for education) I don't use it at all."	"Yes I do use technology at HMS. I use computers when I take a test or when I have to type up a story.[6]"

The two students who did claim to use technology at HMS cited their only reasons for using technology as taking tests. (Given that tests are not given daily, on average, students use technology for 0 hours a day.) The students who do not use technology mostly do not use technology because they do not have permission from teachers, because they do not have access to technology, or because they do not "need to."

1-3 hours – 7 students do not use technology at HMS; 17 students do use technology at HMS

No – 7 students	Yes – 17 students
"I never use technology because we are not allowed to use technology."	"I use it [in] one of my electives compute[r] solutions so basically I use it every day."
"no I don't use technology in class because [I] am in school and it['s] to study not to hear music."	"Yes because sometimes we use laptops for research every 2 months."
"No, I never use my technology in school."	"Yes I use technology at school. We use technology once in a while for tests or projects."
	"I only use my phone in class when my teacher tells me to search something or when we have a party to use are [sic] phones."

The above responses capture this group as a whole, as other responses are similar, or fall into a similar category of response. Several students are under the impression that it is "disapproved of" by teachers if students use their technological devices. One student, as seen above, is under the impression that students are not allowed to use technology in school. Still another believes either that one of the only purposes of technology is listening to music, or that technology will distract or detract from his learning. Of the students who do use technology, students report infrequent use in class, and the only citations of use appear to be: for a computer solutions class, for tests, for papers (not writing, as in a process, but "typing"), or working on a project.



Stationary computer labs are to be used for assessments only. Many students associate computer labs with taking tests.

[6] These are sample responses, which are the most descriptive and will serve to represent that grouping. Other responses were not detailed; some students only responded "Yes" or "No" to the questions.

4-9 hours – 2 students do not use technology at HMS; 17 students do use technology at HMS

No – 2 students	Yes – 17 students
"no I have no need to."	"I don't really use my phone during class unless I am in Ms. McCabe's Responsive Writing class. It's the only time I use my phone during the school day. The only thing I do on my phone…is listen to music while working quietly…"
"I have…used technology in class not a lot at all."	"I use technology whenever the teacher assigns an activity on the computer or if there is a test on the computers like the SOLs.[7]"
	"Yes. I use when I'm supposed to."

The only two "no" responses to using technology are above. They are brief, but they allow us to see more of the population that does not feel they use technology in school. Although 17 students did say they use technology in school, the only reasons referred to in this grouping for technology use fall under the following categories: only when "supposed to," in math or computer solutions class, tests, PowerPoints, free time for games or music, and research.

10-18 hours – 1 student does not use technology at HMS; 7 students do use technology at HMS

No – 1 student	Yes – 7 students
"no because I don't want to get my phone taken away."	"only if we have free time during class"
	"Yes if only teacher say[s] yes."
	"Yes only when we are going to take a test and a review"
	"I use technology in class often to search the meanings of words that I don't understand."

The only student in this grouping who does not use technology refrains from using it to avoid punitive measures teachers may take for the use of technology in the classroom. Again, similar patterns of why students use technology in this grouping emerge: only with teacher permission, tests, and review. One student has identified the specific task of finding new vocabulary definitions online. Some students claim to only use technology with permission from the teacher, or during free time.

24 hours – 3 students do not use technology at HMS; 7 students do use technology at HMS

No – 3 students	Yes – 7 students
"barely use technology in class"	"Yes I use technology in HMS. I use my devices when teachers aren't looking."
"not often"	"When we can use our phone."
"I don't use technology in class, I'm not allow[ed] to use cell phones in school"	"I do not use technology in any of my classes except 2nd period. We use computers when we go to the computer lab[8]."

[7] Students take an end-of-year standardized test in Virginia for most core content areas; this test is known as the SOL.

[8] Herndon Middle School is equipped with 8 computer labs (of either 15 computers, or 28 computers per lab) for an almost 1,000 student population of seventh and eighth graders. Teachers must sign up for labs via Google docs ahead of time to reserve a lab for class assessments. Mobile labs are also available for sign-up, and are designed for enrichment, intervention, and other planned-ahead-of-time activities in class. Logistics of scheduling time for lab has proven to be a barrier for many schools.

After reviewing student responses (and with the knowledge that students have to sleep, and they most likely do not sleep-text), claiming using technology "24 hours" a day or "24/7" appears to be a hyperbolic, or passionate response to using technology. In this grouping, due to students lack of descriptiveness, and overall tone of negativity, three students were grouped into the "do not use technology category," assuming that "barely" using technology and using it "not often" qualify generally as not using it the majority of the time. The students in this group highlighted again an aspect of not receiving permission to use phones and devices as reasons for not using them. One student was bold enough to admit that he does use technology "when teachers aren't looking." Luis gave the third comment in the no category. He does not use technology in class. He, too, believe he is not allowed to use his cell phone in school.

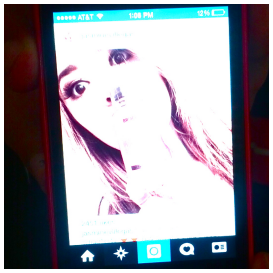
A row of DELL laptops in one of HMS's computer labs

Observations:

Similar, collective patterns emerged among all groups. It does not appear as though certain uses or non-uses of technology are beholden to any single group. If students claimed not to use technology at all or often, it was usually due to lack of receiving permission from teachers or from the belief that devices were not permitted to be used in school in general. This seems to be a significant limitation for the school's BYOD policy. Are there clear guidelines of use for students and teachers? What support or suggestions of use are in place for students and teachers? The major uses of technology in school seemed to be: taking tests, listening to music or playing games during free time, and completing projects, papers, or research, among other less prevalent uses. If students did use technology frequently during the week at school, it seemed to be because a class in their schedule, such as "Computer Solutions," calls for the use of technology. There do not seem to be any deeper, engaging learning activities offered in classes at Herndon Middle School via the BYOD policy afforded by Fairfax County Public Schools.

2. Do you think technology is important for you to be able to use in life?

The majority of students within this representative sample at Herndon Middle School use technology for some amount of time on a daily basis. Whether students are using that technology for texting friends, taking pictures to post on Instagram, checking the time, or some other use, it will be beneficial to identify if students recognize a deeper context to using technology in their lives. Do they recognize the impact that twenty-first century skills will have in their future careers, or is technology just another avenue for social communication and connection? While most responses were brief, samples have been selected to demonstrate responses with patterns, which are collectively supported by several members in each group. These responses below will help to illustrate students' feelings toward the significance of technology in their lives, as well as to provide general observations of students' feelings and opinions toward the significance of technology in life.



Many students interact on Instagram, posting, liking, and commenting on others' photos and #selfies throughout the school day.

0 hours – All 7 students think technology is important to be able to use in life.

No – 0 students	Yes – 7 students
N/A	"Yes because you need a phone to call people." "Yes I think its [sic] very important to look up things and reasearch [sic]. taking test online." "Yes, only if I need it…I use it for my homework." "Yes it makes life esaier [sic]." "I do think technology is important in life because you need to stay hip to everything."

No students in this category thought technology was insignificant to life. It is interesting to note that though these students recognize technology's significance, they do not have access to, or make an effort to use, technology. Generally, this group found technology useful for basic needs: calling for help (in emergencies, too), homework, tests, research, or ease. One student saw a need to stay "hip," or up to date on technology, thus being up to date in life. However, students did not cite any other lasting, or long term, uses or importance to technology outside of the realm of basic, or school-related tasks.

1-3 hours – 1 student did not think technology was significant to life; 23 students did think technology was useful

No – 1 student	Yes – 23 students
"No not really. It can help you with life, but too much technology is bad for you."	"I think technology is important because without technology its [sic] hard to survive in this science age." "Yes I think technology is important Because It helps us move onward too [sic] the future, for the good of mankind." "Yes because you mostly use for homework or at work." "Yes. It's important to use technology…it's a way to communicate and meet other people." "Yes because technology can help you research faster and be able to use it anytime. Technology makes it easier to shop, [entertain] & watch videos." "To find travel sites or a gps and also you connect with familys [sic] [are] in other countries."

While this group also points out basic uses as significance for technology (homework, research, papers, calling people), consistent with the first group, this group has cited more detailed reasons for technology's significance in life. Due to our high ESOL population, many students do have family still living in their home countries. A few students in this group did express technology's ability to allow them to "keep in touch," as one student said. Students in this group cite specific entertainment uses for technology (watching videos, "news stuff," social media, texting, email are among these uses mentioned), in addition to the school-based tasks listed in the first group. Two students touch on society and time, one student mentioning today's need for technology since we are in a "science age," and the other recognizing technology's ability to "[help] us move onward…for the good of mankind." Though these students do not expand upon their claims, it is still remarkable that they are able to view the significance of technology beyond their everyday tasks of texting or researching, Facebooking or taking notes. It appears as though this group, with more frequency of daily technology use, is able to note more uses and significance to technology.

4-9 hours – 1 student did not think technology was significant to life; 18 students did think technology was useful

No – 1 student	Yes – 18 students
"No because it's not that important…some people really don't care about it."	"Yes because it can give news right away." "Yes! to connect with you friends to find out answers or help on your Homework, to connect with family" "Yes since almost everything now can be found on the internet." "Yes everything I do these days [has] something to do with technology. It's like what makes the world go around." "Yes it has created huge advances in every day life!" "Yes it helps with work, even at home." "Yes. I would be failing math without it."

Again, one student does not think technology is important in life; however, this student has said it is not important because "some people really don't care about it." Whether this is due to personal experience or generalized assumptions, we can only conjecture. As to the students who do see significance in using technology, they supplied an array of responses, varying from the basic uses seen in the previous two groups, and expanding into broader observations. One student makes the note that "almost everything now can be found on the internet" whether that is entertainment, shopping, videos, news, or facts, according to some other students in the group. Yet another student admits "it has created huge advances in every day life!" This student emphatically adds an exclamation point to the end of their claim. I find it notable and necessary to

highlight one student's comment in this group: "Yes everything I do these days [has] something to do with technology. It's like what makes the world go around." The students in this group and the last group have noted various communication, information processes (like researching or doing homework), and bigger picture perspectives as to the significance of technology in life.

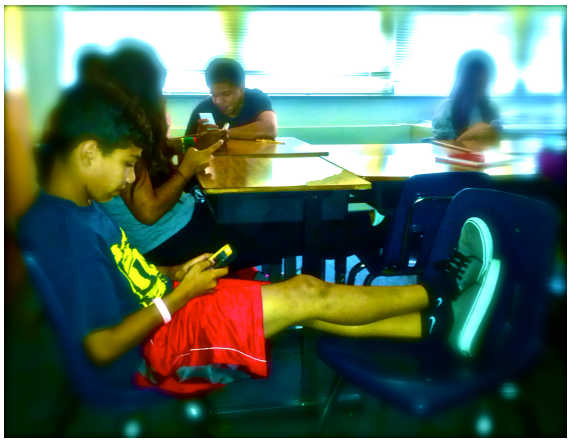
10-18 hours – All 8 students think technology is important to be able to use in life.

No – 0 students	Yes – 8 students
N/A	"Sometimes to solve problems in social life."
	"Yes so I can contact my friends and know things."
	"Yes because if there is an emergency you can use your cell phone to call for help"
	"Yes because when theres [sic] nothing to do…"
	"Yes, because it gives you important information about things around the [world] and it gives you news."

Although all students in this group found that technology is important in life, no students in this group identified larger, long-term, or bigger-picture purposes to technology outside of basic, singular uses. Among the important uses cited: ease, finding information quickly, calling in emergencies, contacting and communicating with friends and family, and doing work. This group's responses[9] were all brief and basic.

24 hours – 2 students did not think technology was significant to life; 6 students did think technology was useful

No – 2 students	Yes – 6 students
"not really because you don't need to sit and stare at a screen all day."	"Yes! It makes life easier. Instead of having paper you can type."
"Yes AND no. Technology may help us with things we really need help with. But people are starting to rely on technology [too] much and don't bother to learn as much because they have a device"	"Yes because I pay more attention when [we're] able to use technology."
	"Yes I do. Cuz technoligy [sic] can change the world."
	"Yes, because you can google things and it also can help you with your homework."



Using technology 24/7: For what purposes are students using their technological devices?

Surprisingly, two students in the group of using technology 24 hours a day or "24/7" have admitted that they do not think technology is important to use in life. Their reasons, however, are quite insightful. The first student chooses the word *need*, specifically, to address the fact that people do not actually need to sit and stare at a screen all day. Perhaps she is implying that there are many other activities that can be done without a technological device. The second student offers both responses, yes and no, and provides a conclusion as to why technology's increasing prevalence in our lives may be negative: "people are starting to rely on technology [too] much and don't bother to learn as much because they have a device." For this thirteen-year-old to have five devices at home, use his iPad daily in class (whether teachers are looking or not), and still be able to see the drawbacks to this use of technology, it is a true testament to the time and consideration some of these students replied with in their responses.

For our "Yes" respondees, ease of communication, researching ability, contacting and communicating with friends and family, and helping with homework emerged again as similar support for the significance of technology. One student who decides technology can change the world demonstrates so, as "cuz," textbook text-talk, has infiltrated this student's hand-written response here. Another response indicates that using technology can be a motivator to

[9] After further analysis into the specific student population that uses technology for 10-18 hours, seven of eight students in this group are identified as ESOL students. Generally speaking, the ESOL students did not give as in depth responses and were more likely to have issues with clearly communicating information (grammar, misspelling prone). Further questions would need to be asked to determine any correlations between ESOL populations and types of responses.

complete work. Indeed, many students across all groups of the survey have indicated that they enjoy listening to music with headphones while working; this is certainly a change from the way students worked decades ago, pre iPod, pre-CD player, pre-Walkman era.

Observations:

Frequency of technology use had no impact on students' responses to this question, as all but 4 students (1 student in the 1-3 hours a day range, 1 student in the 4-9 hours a day range, and 2 students in the 24 hours a day range) thought it is important to be able to use technology in life. What is interesting are the types of responses students supplied for this question. Across the board, each group had basic responses for the significance of technology. The following collective patterns of use for technology emerged: communication with family and friends, help with homework, researching, calling in case of emergencies, and quickly looking up information. Some insightful, in-depth, or bigger-picture responses were provided in all groups but the 0 hours of use group and the 10-18 hours of use group. There does not seem to be any relation between frequency of technology use and perceived significance of technology in one's life. The majority of students believe technology is important to use, with the minority of students believing technology will not be important to use in life.

3. Do you think HMS should have more, or different, technology?

After reviewing students' frequency and types of use of technology, as well as the significance of technology use, it is important to also view students' reflections on the specific technological devices (here referred to as technology, a more familiar term to students) in use at Herndon Middle School. This section provides students the opportunity to consider whether any additional or different technological devices would enhance learning at Herndon Middle School. Select responses, again, will serve to represent each group as a whole, due to emerging patterns of similarity within each group.

0 hours – 4 students do not think HMS needs more or different technology; 3 students do think HMS needs more or different technology

No – 4 students	Yes – 3 students
"No, B/C people would probrably [sic] take advantage of the devices."	"Maybe some laptops should be faster because laptops are slower…"
"No, I like it like this."	"Yes Because it is better for students to have technology like that."
"[If]we have more devices students wouldn't pay attention anymore. Also we shouldn't have different technology because it would be hard to use it if we haven't used them before."	

There is a slight majority in this group of students who do not think HMS needs more or different technology. These reasons vary: students taking advantage of devices in a negative way, acceptance of the way things are now, difficulty of using new technology, or devices as distractions. The students who do think HMS should have more or different technology believes the current technology is old or slow, or that more or different technology would be "better." Students have not gone into more detail about why more or different technology would be an advantage or disadvantage.

1-3 hours – 7 students do not think HMS needs more or different technology; 17 students do think HMS needs more or different technology

No – 7 students	Yes – 17 students
"No, because I think they have just enough technology here, for students to use."	"I think HMS should have more technology…like ipads, tablet[s], nook[s] to make learning fun and have students interact with technology."
"I do not think it is necessary. We have enough but maybe a change could be good."	"I think they could change the technology because the computer[s] are to[o] old and other[s] are too slow."
"No because if we do have more tech or different tech it will be more expensive."	"Yes. We should be able to use iphone and HAVE to have a phone everyday"
"No because technology is bad for your eyes."	"I think that HMS should use more technology, and use it for learning online a lot of the time."

Many students in this group are also accepting of the amount of technology currently in the school, believing in a "Goldilocks" amount of "just enough technology here." Other students do not think other technology would be necessary because of cost or harm to vision[10], but even so, some negative responses had potential positives listed in them, such as one respondee suggesting that "maybe a change could be good." Of those students who do think more or different technology at HMS should be an option, again this group cited reasons of slow or old technology necessitating new technology. Students suggest being able to use their own phones, or for the school to have specific technology such as ipads, tablets, or nooks "to make learning fun and have students interact with technology." This group gave specific suggestions and reasons to back up their suggestions.

4-9 hours – 7 students do not think HMS needs more or different technology; 12 students do think HMS needs more or different technology

No – 7 students	Yes – 12 students
"I don't think HMS should have more, because it is school, not college."	"Yes. To insure we get facts right on project[s], Research can be done quicker, Communication between teachers and students, etc."
"I think HMS is perfect the way it is. I think there is enough technology at HMS and that it shouldn't change at all. If we have more technology, some students might take advantage of this."	"Yes we should have different computer[s] because the computers here are slow."
"Well not really because some people don't like to use technology that much…atleast we have computers."	"I think HMS should have more advanced technology like tablets and more upgrated [sic] laptop[s] but I still think there should be book[s]."

Seven students in this group do not think HMS needs different or more technology: many repeated earlier groups' reasons, and others brought up new points. Many students were grateful to have any technology in the first place, then, not believing we needed more. Another student thinks technology is a privilege to be earned in college, and that middle schools should not have technology. More students are afraid of students taking advantage of the technology. On the affirmative side, students think more or different technology can: increase communication between students and teachers, improve upon the speed of current technology at the school, and provide more advanced technology and resources which will complement more traditional resources, like books. This group recognized that HMS does have technology, and either think it should be maintained or replaced.

10-18 hours – 2 students do not think HMS needs more or different technology; 6 students do think HMS needs more or different technology

No – 2 students	Yes – 6 students
"No because it already [has] a lot [of] technology."	"they should have better computers"
"No they have compute[rs], smartbo[a]rds, ipads and probly [sic] more"	"I think HMS should have more technology [sic]"
	"Yes, They should even have a technology class."

The two students[11] who do not think HMS needs more or different technology believe it has a lot of technology, one student listing some known items and suggesting "probly more." Many students echoed the common reason of many groups up to this point that HMS should have "better" or "faster" computers. No students in this group made any specific suggestions to types of technology or brands of computers. One student suggests that HMS should have a technology class[12].

24 hours – 1 student does not think HMS needs more or different technology; 8 students do think HMS needs more or different technology

No – 1 student	Yes – 8 students
"no, there is alot [sic] of tecnology [sic] in school."	"Different [technology] bc the computers are very slow."

[10] According to a Washington Post article, technology *can* be bad for your eyes, causing "computer vision syndrome." However, symptoms only usually occur after a user has been staring, mostly unblinkingly for several hours at a time at a screen. Taking breaks away from a screen, being sure to blink, and treating symptoms with drops can lessen any negative impacts of longer times using technology.

[11] The two students who chose this response and reason are enrolled in one of two classes at HMS which piloted an iPads in the classroom program. As such, they had access to more technology daily than most students at HMS. Further inquiry could discern whether this speculation contains any truth.

[12] Herndon Middle School offers a course, titled "Tech Education (Shop)," which many students in seventh and eighth grade take as an elective.

	"Yes, because it would help us with out work and…give us more experince [sic] with working with technolgy [sic] in case we work with it when we are older." "Yes, my school last year…gave us tablets to borrow"

Again, one student has suggested that HMS does not need more or different technology because of a belief that HMS does have a lot of technology in school. That computers at HMS are too old are slow is a repeated theme by the majority of students in this group. In addition, one student reflects on previous personal experiences at a school, which had a tablet program in place for students. Another student looked to the future, suggesting that more technology would allow students to work with technology in case they work with it when they are older. These responses are more creative than others, looking to the past or future, while the majority of responses reflect an assessment of current technology at the school.

Observations:

There is a definite split in responses for this question, though the majority of students in all but one group, the 0 hours of technology use a day group, believe that Herndon Middle School should have more or different technology. The most common reason for deciding more or different technology is not needed for HMS is that HMS has a lot, or enough, technology. Students in groups for this negative response did not assess the efficiency or type of technology used, just availability at the school. Students in the groups who answered that more or different technology was needed for HMS gave varying reasons for their decisions: previous schools used other technology; being able to interact with technology will prepare students for the future; iPads, nooks, and tablets may make learning fun; and the most common reason for wanting more or different technology, the current technology is slow and old or outdated. When students suggest that HMS has a lot or enough technology, what experiences are they comparing this to? Do they evaluate the quality of uses or efficiency of devices in their responses? Do educators just need to better utilize the amount of technology available? Are students and educators aware of what technology can be used for in the classroom, and would students have a different opinion on the technology that HMS has or could have if they knew the opportunities that lie in new technology?

Final Observations and Recommendations

Luis, among other students, do not think phones are allowed to be used in school, are afraid of having their device taken away if they use it, or never receive permission to use their device in class from teachers. Some students believe that HMS has enough technology, or that more technology would only provide more distractions or opportunities for students to take advantage of technology. Despite the BYOD policy being in place in Fairfax County Public Schools since 2011, it appears as though teachers and administrators have not fully implemented the policy at Herndon Middle School. Thus far, the policy is just a policy handed down from FCPS, not a full-fledged, integrated-into-lessons at HMS program.

I recommend a shift from a policy that is merely posted on the school's website, to a fully supported program, which is explained to teachers and students at the onset of each school year. More resources need to be made available to teachers to encourage and clarify the varying uses and ease of use of technology in school. Significant professional development time can and should be dedicated to potential uses of current technology at school to make use of technology that students already possess. Professional development can signify free online experiences like Education World's video-based tech tutorials, exploring and sharing new apps like ClassDojo with colleagues, developing and attending in-school staff development sessions dedicated to differentiated ways in which teachers may integrate various technology and apps into their classrooms, and "Snack and Study" sessions (the name used at HMS for free and quick staff development provided occasionally at lunch times) dedicated to quick snapshots of BYOD support and resources.

Necessities for a Successful BYOD School Policy:

-Professional development opportunities
-Available support & resources for educators
-Suggested safe apps and their specific uses for educators

All but two students within the survey population had some access to technology, whether that technology was solely at home, or a portable device brought to school. Supplementary device programs could be suggested and implemented for students who are already on the free or reduced meal program that do not possess a device at school. "Access," however, is a broad term: it does not ensure that users of a technology are capable of using the technology productively. Warschauer demonstrates this fact in *Models of Access: Devices, Conduits, and Literacy*, by stating that "the presence of absence of [a] computing device is only a small part of the broader context that shapes how people can actually use ICT [Information and Communication Technology] in their lives." Just as access to devices does not equate to students' technology literacy, student access to devices does not mean teachers will feel supported in integrating technological devices in the classroom. Some potential reasons that educators may not be implementing the BYOD policy in classrooms (leading to many students' perceptions that phone use is banned in school) might be: they do not know about resources, do not feel that resources and support are available, or do not want to or know how to take on the distractions and disadvantages of devices in the classroom, among other reasons. With professional development and support from

administration, technology staff in the school, and online resources such as those below, educators will be better prepared to put this BYOD policy into motion.

- Edudemic's list of 30 apps for classrooms
- Te@chThought's list of 20 BYOD apps for classrooms
- Edutopia's array of articles dedicated to assessing and supporting BYOD programs

It is recommended that apps are organized by access to IOS or Android systems and by purpose (i.e. Notetaking…consider: Google Docs, Evernote, Drafts) and made visible and accessible to students and teachers for quick reference. It is recommended that this information be quickly accessible and easy to understand. Suggested (and certainly not exhaustive) formats are: posters in classrooms, poster graphic displayed on the school website, or a laminated mini-poster for quick reference within student desks.

*Some of the educational apps advocated for on **Edudemic's website**, including a classroom management app (Class Dojo), a coding app (Scratch), and a notetaking, reminder, and picture-capable app*

When teachers understand how to use apps and integrate the BYOD policy within their classrooms, it will be much easier to convey rules, expectations, and consequences of technology device use to students. Teachers will be able to make students aware of the existence of the BYOD policy, and also enjoy a more frequent use of technology. In order to avoid distractions, or slowing down of instruction due to misuse or abuse of technology, clear rules need to be put in place and conveyed alongside other school policies in rules in Herndon Middle School's SRR, or student handbook. Teachers will feel more supported with a clear communication of consequences by administrators, and it is suggested that teachers are included in the process of researching, shaping, and writing the official policy, resources, and consequences of the implemented program of the BYOD policy at the school.

Technology holds endless and exciting possibilities in the classroom, and more fully integrating technology through Fairfax County's BYOD policy can be a start for Herndon Middle School. While many students may think the school needs more or different technology, it is suggested that Herndon Middle School make use of technology, which has until now been told to stay in students' pockets, muted or turned off. It is time to move away from confiscation and toward creative integration. Although the whole student population will not have access to personal technological devices, cheap alternatives may be found and supplied to students in need. Cell phones used to be exorbitantly expensive, but over time they have become more accessible financially. One day it may be feasible for all students to have a personal device, whether a cell phone, iPod, or other device with Wi-Fi accessing capabilities.

One day, the idea of the flipped classroom may become a reality with the implementation of BYOD programs in full swing. The National Education Association (NEA) has examined the possibilities and pitfalls of BYOD programs in schools and foresees that the future may hold flipped classrooms like Gould Burgess has implemented in her class in an Avon, Ohio school. The premise is that students are able to read about or watch videos about a topic at home (to take place of the traditional in-class lecture or direct instruction) so that time is freed up at school to do more meaningful applications and higher level thinking. The same article addresses the cost concerns of most technology implementation programs, advocating for BYOD programs' ability to "save money if implemented properly." However, as seems to be the case at Herndon Middle School, "tossing teachers into a BYOD environment without any training wouldn't be very effective." Herndon Middle School holds a BYOD policy, but this is merely a label of potentiality. Administrators, technology support staff, teachers, and students need to work together to make the policy mean something more. Working together will allow the BYOD policy to blossom into a technology integration program that may someday become a highly sophisticated, interconnected exchange of ideas and information via flipped classrooms.

One day, this may be a reality, but today we still have students who believe it is punishable to have phones in school. We still have teachers who do not know how to make the BYOD policy more than just a policy at their school and in their classrooms. For now, we have students forgetting to bring pencils to school. Something tells me if technological devices were a welcome, integral part of daily lessons at schools, they would not be as forgotten as pencils are now. But who's to say pencils are forgotten?

Today was the last day of the 2013-2014 school year for Herndon Middle School and as I bid farewells to one of my classes, Luis walked up to me with a smile and a hug.

"Ms. Ochman, I remember you gave me a pencil six months ago. Thank you."

Let us remember that no matter how many pencils a student forgets or how much technology a teacher integrates into a lesson, the heart of teaching will always lie in the relationships we forge with our students and the lasting memories we create. We must not be blinded by the flashing, neon light signs that technology sometimes represents, and instead look for ways that technology and BYOD policies can focus us to our purpose, and to a path of student success and lifelong learning.

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Suggested Readings

Apps Power Productivity
By Kimberly-Clark for Apple Inc.

Bring Your Own Device: Preparing for the influx of mobile computing devices in schools
By CDW

Bring Your Own Device Toolkit
By K-12 Blueprint

BYOD to Schools? Protecting your network has become an issue in the era of bring-your-own-technology
By Scholastic

The Flipped Classroom: Online instruction at home frees class time for learning
By Bill Tucker

The Promise and Failure of BYOD in Education
By Chambers Daily

The Real Work of a 21st Century Education
By Institute of Play

Simplifying Bring Your Own Device (BYOD) in Education: New solutions ease management and ensure security
By Hewlett Packard (HP)

Students: bring your own technology to uni:
Asking students to use their own tech in lectures could save money, but will it damage attention spans?
By Mirren Gidda

Make A Difference

To make a direct impact on the technology integration and exciting innovation happening in today's classrooms, consider donating to one of Ms. Ochman's classroom projects on DonorsChoose.org, a great website which helps classrooms in need *get* what they need.

Two iPad Minis To Create a Highly Interactive Classroom

Dry Erase Markers and Boards: Participation for Every Learner

Or, donate to any high poverty school project on DonorsChoose.org.