Review of research into the benefits of implementing One-to-One access at the elementary and middle school. The rationale for implementing One-to-One at WMS instead of a BYOD hybrid; are there other districts using the hybrid and, if so, do they offer group rate purchasing to families or do they specify the models that are acceptable?

In 2012, I co-authored the Bring Your Own Device (BYOD) Guidebook: A Practical Guide to 1 to 1 Success. The time for BYOD is now in the past. BYOD was a perfect fit to the education community while school districts were determining the value of the use of technology throughout the curriculum and on a regular basis as well as determine how to fund these initiatives in a cost effective way. Luckily, the cost of technology required to facilitate a One-to-One program has gone down greatly. Formerly a laptop could cost over $1000 and be difficult to repair as well as heavy for students to carry. Now with the development of mobile devices such as the Chromebook, which can be provided to students for under $350 (including the device and license), and weighs significantly less, it allows districts to implement these programs in a better way than the past and, at a time when the education community has developed numerous strategies that show the benefit of devices being available to all students, when they are needed to support instruction.

In 2013, I wrote an article entitled "Is Your School Ready? Necessary Preparations for Online Assessments." As part of that article I took a look at the comparison of district provided devices vs. BYOD devices. This research, which involved school districts in both Texas and New York, demonstrated one consistent trend: in order to have an orderly administration of online assessments that devices the students used to take the assessments needed to be the same. This allowed for better training of staff, better familiarization for the students, and easier technical support from the I.T. Department. The considerations for BYOD and district provided devices have a number of considerations as articulated by Wallin (2011). Of these considerations, one of them is the opportunity for virtualization of resources and applications thus ensuring the availability of all the tools that are needed to support curriculum.

In Weston's decision to implement a One-to-One program, these themes were considered. We did not make the decision based on the need to provide testing, but we did make this decision based on the needs for the teachers to have a consistent tool that they could use when needed that would be reliable and manageable for all students.

During my doctoral studies I wrote a paper on Theory vs Practice. As part of this paper I specifically looked at BYOD.

This paper indicated many researchers have shown that the use of technology in the classroom helps to support student learning by promoting student engagement. When students are engaged by class material, they learn faster. The implementation of BYOD, like the implementation of any new technology, is not without its struggles. BYOD changes the classroom model from a teacher-directed classroom to a teacher-guided classroom, which has been referred to in education professional circles as a flipped classroom.

BYOD helps support independent learning and allows for a custom learning environment for each student; however, although this supports student learning, it also introduces new struggles for the teacher, such as being able to provide support and answer questions about many different kinds of technology (Ballagas, 2004). Teachers, like parents, are the people children go to for answers, and this is true for BYOD classrooms as well. Now students who have trouble with their laptops, iPads, netbooks, and Macbooks ask their teachers for help. This puts an additional strain on teachers to learn how to troubleshoot technology and takes away from valuable instruction time.

In my review, to bridge the gap between theory and practice in the area of student used mobile devices, it was necessary to ensure that all students have the same device available to them. This is a One-to-One model. For this or any theory to be put into practice, appropriate professional development needs to be provided to the staff involved to ensure the success of the program and to minimize the interference that any new program will have on teaching and learning (Abbott & Collins, 2004). The research conducted by Abbott and Collins (2004)

acknowledges that appropriate support and training are essential for talented individuals to fulfill their potential. In addition, proper technical support and resources need to be in place to ensure that the teachers are successful in their implementation of technology. By using a One-to-One model we have ensured that teachers will be committed to providing quality instruction and the I.T. department will maintain the hardware in a straightforward and cost effective method.

Additional research also supports this method. William Penuel (Penuel, 2006) of SRI International, researched the effects of one-to-one computing initiatives in his paper, :Implementation and Effects of One-to-One Computing Initiatives: A Research Synthesis". His findings indicate that the studies he reviewed consistently reported positive effects on technology use, technology literacy, and writing skills. He also indicated that the expectation that one-to-one initiatives will improve achievement scores is likely but would require further investigation. As I mentioned earlier, he also points out the importance of appropriate professional development and planning for the teachers.

An international research collaborative also looked at the impacts that one-to-one technology would have on enhancing learning. Chan, et.al. (2006) found that ubiquitous access to mobile, connected, and personal devices, the increased pace of technological development, and the evolution of new innovative uses of these devices will create the potential for a new phase in the evolution of technology-enhanced learning, characterized by "seamless learning spaces." In my previous presentations we have looked at this concept and referenced them as "anytime anywhere learning." This is one of our goals for the one-to-one program in Weston. The availability of devices during the school day as well as at home, coupled with the district's initiative to establish a Learning Management System, will help to ensure that Weston provides the best possible education for their students and remains an education leader in the State of Connecticut.

Research continues in this area and my hope is that Weston will be able to contribute positively to the body of knowledge that is available

regarding education technology. For example recently published articles include:

"The Effects of Combining One-to-One Computing, Interactive Core Curriculum, and Digital Teaching Platform on Learning Math: The case of a Charter School in New York City." (Weiss, 2016) This research indicated a significant increase in standardized test scores for those students participating in the program by teachers demonstrating significant growth in their effectiveness in differentiated instruction.

"Trends of Mobile Learning in Computing Education from 2006 to 2014: A Systematic Review of Research Publications." (Anohah, et.al., 2017) This journal focused on the review of literature in three primary areas including recent technological developments, pedagogical approaches applied and practical effects and learner contexts. Their research was designed to provide guidance to educators on the implementations of one-to-one learning programs.

These are just two of numerous examples of research that support the implementation of One-to-One programs in education.

There are no districts actively pursuing a BYOD model. As technology integration has grown over the past years the model for integration has also grown. Because of the reasons identified above the One-to-One approach is the best approach for Weston Public Schools.

We have visited and spoken with a number school districts during our evaluation process. Information regarding other school districts are included in the following question.

Abbott, A., & Collins, D. (2004). Eliminating the dichotomy between theory and practice in talent identification and development: Considering the role of psychology. *Journal of Sports Sciences, 22*(5), 385-397. Retrieved from http://go.galegroup.com.rlib.pace.edu/ps/i.do?id=GALE%7CA117423233&v=2.1&u=nysl_me_pace&it=r&p=GPS&sw=w

Ballagas, R., Rohs, M., Sheridan, J.G., & Borchers, J. (2004). *BYOD: Bring your own device*. (Lancaster University) Retrieved from http://www.vs.inf.ethz.ch/publ/papers/rohs-byod-2004.pdf

Tak-Wai Chan, Jeremy Roschelle, Sherry Hsi, Kinshuk Kinshuk, Mike Sharples, et al.. (2006). One-to-one technology-enhanced learning: an opportunity for global research collaboration. Research and Practice in Technology Enhanced Learning, World Scientific Publishing, 1(1), pp.3-29.

Penuel, William (2006). Implementation and Effects of One-to-one Computing Initiatives: A Research Synthesis. International Society for Technology in Education, 38 (5). Retrieved from: http://files.eric.ed.gov/fulltext/EJ728908.pdf

Wallin, L.O. (2011, October 11). Gartner's view on "bring your own" in client computing. Retrieved from http://my.gartner.com/portal/

Weiss, Dovi. (2017). The Effect of Combining One-to-One Computing, Interactive Core Curriculum, and Digital Teaching Platform on Learning Math: The Case of a Charter School in New York City. Handbook on Digital Learning for k-12 schools, Springer International Publishing. Doi= 10.1007/978-3-319-33808-8_20.

Review of what other high performing districts are doing in this area.

All districts have begun a process of making computer devices available to students when needed. Our nearby school districts, Ridgefield Public Schools and Greenwich Public Schools, have both successfully implemented a One-to-One program in the middle school. We recently visited Ridgefield Public Schools to be able to learn from their experiences. Both students and staff spoke with us and expressed the positive impact that the devices have had on curriculum and instruction.

Review of status of implementation of One-to-One at WIS

The implementation of the One-to-One program at WIS has been a terrific enhancement to the school community, but most importantly to the curriculum and classroom experiences that the students are able to have. Technology has always been used in the classroom, previously it was used by "borrowing" a laptop cart from the library. This limited the amount that it could be used, caused problems with conflicting demands for access to technology and did not allow for accountability for each of the devices often causing devices to not be repaired in a timely fashion. All of these items have been removed with the institution of the One-to-One program.   Now teachers are able to use technology in their lessons on demand and as needed. This has seen an increase in the use of the technology which in turn shows an increase in the associated 21st century experiences that students have. By providing greater exposure to 21st century skills through the curriculum as recommend by the International Society for Technology

and Education (ISTE) and the American Association of School Librarians (AASL) will ensure that our students meet the goals of technology literacy by the end of 6th grade.

This implementation was supported completely by the WIS staff. They were excited and energized to bring these new tools to their students. The partnership between Jane Sabini, Technology Integrator, and Helen Knudsen, Library Media Specialist, ensured the successful implementation. Ms. Sabini provided direct instruction to each of the classes on digital citizenship before the devices were put into use. Both Ms. Sabini and Ms. Knudsen continue to provide support to the teachers in the classroom through coaching and team teaching to ensure successful implementation.

The program as it is implemented in each school will be a process of refinement. We have learned from this implementation the value of classroom management tools, the need to have easily accessible spares for when the "oops" inevitably happen in the classroom amongst other things. We will use what we have learned at the WIS to help the implementation at WMS. For example, the WMS teachers will be scheduling time to meet with WIS teachers to discuss their rollout as well as understand the expectations that students will have when they enter 6th grade next year.

Review of relevant professional development on One-to-One already completed and plans for FY18 and FY19, noting in particular the degree to which WMS faculty has been trained. Review of extent to which use of One-to-One has been and still needs to be integrated into instruction at WMS and WIS.

Professional development for integrating one-to-one devices into the curriculum as well as other curriculum related initiatives are an ongoing process. Teachers are already very familiar with the use of technology, the use of Chromebooks and using them in the classroom. This can be seen by the demanding use for the devices currently available in computer carts. At a basic level the switch to a one-to-one environment ensures that the devices are available when the teachers need to use the devices to support curriculum and instruction. Professional development will begin with the Curriculum Instruction

Leaders partnering with the classroom teachers and the learning commons staff to support the further integration of technology into additional lessons. This may also include the reimagining of how lessons are conducted and how homework is provided. The addition of these tools will create new opportunities for teachers and students. As with any initiative, particularly technology in education, there are varying levels of acceptance by different staff members. Early adopters will begin to use the devices faster and earlier. These more comfortable teachers will be the natural peer leaders in their schools. Professional development will be provided to ensure that all teachers are supported at their level and are brought to a high performing level as soon as possible.

Similar to the evaluation of the overall one-to-one program, the evaluation of the effectiveness of professional development will be gauged on observation of instruction and feedback from staff. There is no doubt that the devices being available will increase their use as part of instruction.

How would use of chromebooks be implemented at WMS – which grade(s) in each of the two years; will devices be issued to students or on classroom carts; will students be permitted to take devices home (if so, who is responsible for damage, theft, loss)?

The budget book has been updated to reflect our current thinking which is to implement and rollout the One-to-One program at the WMS in the fall of 2017. All grade levels will receive Chromebooks during the first trimester after appropriate training and coaching is provide.

The school team and central office leadership are still in the process of reviewing how the One-to-One program will be implemented at the various grade levels. We are looking at a number of options including allowing all students to take devices home as well as modifying the 6th grade students ability to take devices home to either not taking them home for the first half of the school year or not taking them all for the entire year. These are still discussion points for the team that will be resolved in a developmentally appropriate way while supporting the curriculum goals of each grade level.

At what point are computer labs obviated; are there any future savings as a result?

Specialty computer labs such as the Macintosh computer labs for art, music, and videography and higher-end computer labs for Project Lead The Way (PLTW) and Computer Programming will always be standalone computer labs and need to be supported in the future. This is because of the types of programs required to support the curriculum and best prepare students for future college or career plans.
General use computer labs will be phased out throughout the One-to-One rollout. No direct savings will be seen. An indirect savings will be caused by not having to replace the computer labs in the future.

Is the current infrastructure (or with the proposed items to be purchased or leased in FY18) sufficient to meet the demands of One-to-One usage?

Yes, as part of the I.T. Infrastructure plan we have planned for the implementation of the One-to-One program at Weston Middle School. Each year we will evaluate and enhance the infrastructure to ensure a continued smooth implementation of the technology.

Is the proposed technology staffing sufficient to meet the demands of One-to-One until the additional 1.0 FTE comes in as proposed in FY20?

Yes, we believe so. But we will reevaluate staffing each year along with our other technology budget focus areas.

How will the educational impact over time of One-to-One be measured?

In Weston education impact of the One-to-One program will come from three primary areas:
  Observations of technology integrated lessons including quantity and quality
  Feedback from students and staff
  Student assessment on digital literacy

How soon would the items purchased need to be refreshed?

The refresh cycle for devices vary by the type of the device, the usage or the location of the installation. Most devices have a life expectancy of 3 to 5 years. We work diligently to stretch the life expectancy to 5 years when possible and the devices still support the curriculum needs of the students and staff.

Windows OS Laptops – 5 years

iPads – 5 years

Macintosh OS computers – 5 years

Chromebooks (Chrome OS) – 5 years

Note: Google does regulate the end of life of Chromebooks.

https://support.google.com/chrome/a/answer/6220366?hl=en

Why is the entire purchase for WMS proposed for FY18?

The entire purchase is proposed during the FY18 funding year because all devices will be purchased and distributed during the 2017-2018 school year. Our original plan was to distribute the 6th grade devices in the beginning of the school year (September) followed by the remaining devices in the spring of 2018 (April/May). We have since refined that approach to take an approach similar to what has been used in successful school districts such as Ridgefield Public Schools. All devices will now be distributed during the first trimester of the 2017-2018 school year. This will provide better support for the curriculum and clear expectations for all students and staff.

Page 184 - In the third paragraph, please explain what issues arose from the "reconciliation of past expenditures" and if those issues have been addressed going forward.

Prior to the 2016-2017 budget year acquisition of software was decentralized. Some was purchased by the IT Department; some was purchased by each school primarily through the Library/Media Specialists and CIL's; purchases for Central Office were made by each department. For the 2016-2017 school year software purchasing has been centralized in the IT Department. We are working toward standardizing terms to increase control over renewals and examining licenses for duplications or overlap.

We are confident that the majority of these purchases are now under the control of the IT Department but we continue to have some work to do in ensuring that we are maximizing our value of each license.

Page 184 – Please explain the significance of implementation of CT PA 16-189.

Connecticut Public Act No. 16-189, An Act Concerning Student Data Privacy, went into effect on October 1, 2016.   This has imposed requirements on any operator of a website, online service or mobile application regarding the use and security of Student Data. More importantly for us, it voids any contract which does not comply with all of the provisions of the law.

We are now having to perform additional work to monitor vendor compliance and communicate with parents regarding vendors and contractors. The extent of these efforts is still an unknown. Initially there will be a substantial amount of time invested in establishing a baseline of data, the maintenance of which will require ongoing resources but to a lesser extent. There are also bound to be modifications made to this legislation over time to which we will have to respond.

Proactively we have worked with an outside vendor to develop a database that will help track the requirements for PA 16-189. The database is already in the process of being populated with information as our review process continues. By trying to be ahead of the curve with this information we hope to have a smooth implementation of the new law without little impact to curriculum and instruction.

Currently the State Legislature is reviewing this law and we expect modification to be made that may ease the implementation and ongoing support.

Page 185 – Please walk through the tech staff reorganization and how it will best serve the district.

The reorganization of the technology staff will have a few impacts. It allow for articulation of technology skills instruction between the K-4 grades. The same individual will be the computer teacher in both Hurlbutt Elementary School and the Weston Intermediate School. Additionally it will create a greater partnership with the Learning Commons by partnering the staff into two teams to support both the technology and library standards. These teams divided by elementary and secondary levels will work closely together to support all programs such as new programs like our one-to-one program and Makerspace as well and equally importantly our current literacy, technology integration and library programs. These programs have been changing over time and have been working together successfully over a number of years as represented by our teams work on developing the Common Elements of Learning. These new teams are represented in the individual school budgets.

Page 186 – What is the rationale for doubling the line for overtime?

The approach the district is taking in advancing the delivery of curriculum is to provide increased technological resources to staff and students when needed and to reduce the downtime experienced by staff preventing them from using the technology as part of the curriculum. Support tickets of an urgent nature or items requiring access to classrooms when students are not present are done after school hours. Overtime is all paid to technicians for the videotaping of the Board of Education meetings. This has been paid in the past but from various accounts. To support transparency we are consolidating this to one account.

Page 186, Lines 3220/3221 – Please review the nature of the consulting services that are received.

In a department of our size it is impossible to have in-house expertise in all of the current hardware and software. The consulting services that we use are primarily for specific projects in areas outside of our abilities or for training to allow us to expand our capabilities in a cost

effective and efficient manner. Use of these consultants is frequently a better option, from both a cost and effectiveness perspective.

Pages 186 and 189 – Please review in more detail the three items accounting for the $30,800 increase in line 3309 "Services".

CEN Internet Access - $10,000
This cost is no longer funded by the State of CT and must be added to the BOE budget.
VMware Mgmt and Maintenance - $15,800
This item had not been included in the budget previously. We believe it may have been paid out of alternate accounts in the past. To support transparency we are adding this to the budget directly.
Printers Mgmt and Maintenance - $5,000
Represents on going service and maintenance of printers throughout the district.

Page 187, Line 5880 – Please review each of the new Conferences and what the tech staff is anticipated to gain from attending.

These conferences are the same conferences that staff have been historically attending. There are no new additions of conferences. We have now clearly outlined the conferences that staff attend in a separate account to help support transparency.
    ISTE – International Society for Technology and Education – This conference is only attended when it is located in the Northeast. It is attended by teacher representatives with a focus on learning new teaching methods, new technology tools, and provides the ability to collaborate with peers from other parts of the country.
    CECA – Connecticut Education Computer Association – This is a Connecticut conference and is attended by the computer teachers, library media specialists, technology integrators and other CIL's as appropriate. The focus of this conference is to support the collaboration and best practices between school districts in Connecticut. This is attended yearly.
    COSN – Consortium of School Networks – This is a national conference focused on Chief Information Officers and Directors of

Technology. It is attended yearly by the Director of Digital Learning. The goal is to support networking and best practice conversations on the level of technology leadership, instructional leadership and governance.

Page 189 – In Professional Technical Services, please explain Vmware and whether there are any options to replace the funding that is no longer available from the State for CEN Internet Access.

VMWare was explained above.

There are no other funding options for Internet Access. The State formerly provided Internet access to all public schools at no cost. It no longer does. In future years we could seek to change Internet Service Providers (ISP) to see about reducing the costs as the technology changes.

Page 190 – Please identify any new software with an asterisk along with a brief explanation of what it is.

Learning Management System – A learning management system is a software application for the administration, documentation, tracking, reporting and delivery of electronic educational courses or training programs. It also serves to augment the lessons the teacher is giving in a brick and mortar environment, not just replace them. It is the infrastructure that can deliver and manage instructional content, identify and assess individual and group learning or training goals, track the progress towards meeting those goals, and collect and present data for analysis to assist decision making and planning.

CABE Meeting Manager - This is a user-friendly, web-based service specifically designed to assist the Board, Superintendent and Central Office in preparing for and running Board of Education meetings. It eliminates the need to print and distribute board packets in hard copy, provides faster controlled electronic communication to the community, creates minutes during the meeting, and provides searchable archived meeting documents.

TalentEd - This is a comprehensive evaluation system designed to handle all of our employee evaluation needs. It is used in other school districts in Connecticut to support the teacher evaluation program. As a highly customizable program it is a perfect fit to Weston's Teacher Evaluation program to ensure that the workflow meets requirements, supports teacher personal improvement plans while not overly burdening staff with administrative functions that would take them away from their primary focus of teaching and learning for our students. It is online and includes automatic workflow, e-signatures,evaluation processes, surveys, personal improvement plans as well as evaluator reliability monitoring to name a only a few features. It is also compatible with mobile devices. TalentEd has been used successfully in Ridgefield Public Schools for many years.

Tableau - This is a data analytic tool. It was implemented in the current school year (2016-17) to begin the process of forming a usable data warehouse to provide reliable data to Instructional Leaders with verifiable data to support data-driven decision making. This year we are focusing on cleaning and loading data into our data storage location (PowerSchool) while simultaneously beginning to create data visualizations to be shared with staff in Fall, 2017.

Page 190 – As with other aspects of the technology budget, the Learning Management System will require a refresher for the Board.

The Learning Management System was presented during the technology presentation in the November, 2016 as well as in the Spring of 2016. The links are included below. The Learning Management System selection is beginning its review process now. A committee of teachers representing all grade levels and various subject areas are involved with the process. The LMS will be an integrated system that will eventually replace teacher websites, streamline the teacher's ability to only have to update 1 location with assignments and instructional material as well as enhance parent communication.

**Presentation 11/2016 -
https://drive.google.com/file/d/0B_32JGQe7YQ7bXJ5bUxuQ2dud
zA/view?usp=sharing
Presentation 5/2016 -
https://drive.google.com/file/d/0B_32JGQe7YQ7VG9DTUtyWXA0
SHM/view?usp=sharing
Presentation to the Board of Finance and the Board of Education
in 2015 covering this area - https://drive.google.com/file/d/0B-
wD-em-tWGmYWlfcXZrR3c3ZTA/view?usp=sharing**

Page 192 – Is the $45,000 for Town Shared Services a static number?

This number is impacted by the staff in the I.T. Department. No change
has occurred in the staffing since this base number was established. In
this year's budget the addition of $2000 was added to the budget for
on-call costs. This has been also added to the Town's technology
budget to be reimbursed to the Board of Education. This additional
cost is caused by the I.T. staff needing to be available for after-hours
support for other town departments and emergency services.

Pages 193-194: Are we planning to continue with Smart Boards or is there a new
technology on the horizon (before we refresh 20 at $50,000)?

We are replacing SMART Boards with Epson Interactive Projectors. We
have been following that process for the past year. This was reviewed
in last year's budget presentation as well as the technology workshops
in the Spring and Fall of 2016. Links to the presentations are here:
Presentation 11/2016 -
https://drive.google.com/file/d/0B_32JGQe7YQ7bXJ5bUxuQ2dudzA/
view?usp=sharing
Presentation 5/2016 -
https://drive.google.com/file/d/0B_32JGQe7YQ7VG9DTUtyWXA0SH
M/view?usp=sharing
Presentation to the Board of Finance and the Board of Education in
2015 covering this area - https://drive.google.com/file/d/0B-wD-em-
tWGmYWlfcXZrR3c3ZTA/view?usp=sharing

Pages 193-194: How many units are represented by each item on the list on page 194 (that is not already listed) and what are the per unit prices? Please add a per unit price column on page 193 too.

Updated in budget document.

Pages 193-194: What is included in the $35,000 for new staff technology and why is it needed?

This amount was listed separately to help support the transparency of the budget. The dollar amount includes:
$20,000 -- Purchase of new computers for new staff as required including relevant peripherals.
$15,000 -- Purchase of new technology for students under 504 plans. These students are not in the special education budget but part of the regular education budget.
The budget book will be updated to better reflect the categories for the use of these funds.