Module 40- Unit 4- Activity 1

Impact of Technology on Learning:
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Introduction

Technology has a seemingly limitless potential to enhance education, whether it be via increasing student engagement, saving teachers time, personalizing learning, or preparing students for the digital world we live in now. However, studies have shown that the extent and intensity of its use has a critical impact on its effectiveness (Bryant et al., 2020). Furthermore, technology in the hands of the teachers is associated with higher scores than technology in the hands of the students, and the type of device that is being used in the

classroom can determine whether the learning outcome is positive or negative (Bryant et al., 2020).

These studies show us that it is important to think critically about how technology is used in the classroom; it is vital not only to use the right tools, but to use them in the correct ways in order to maximize their efficacy and improve learning outcomes. This report takes a closer look at how technology is currently being used at a primary school in Hungary by surveying administration and teachers. It looks at what technology is currently able to do at the school, and what the school's vision is moving forward. Finally, it suggests some ways in which technology use in the school can be improved to maximize its potential and improve student learning outcomes.

Summary

Administrator Interview Findings:

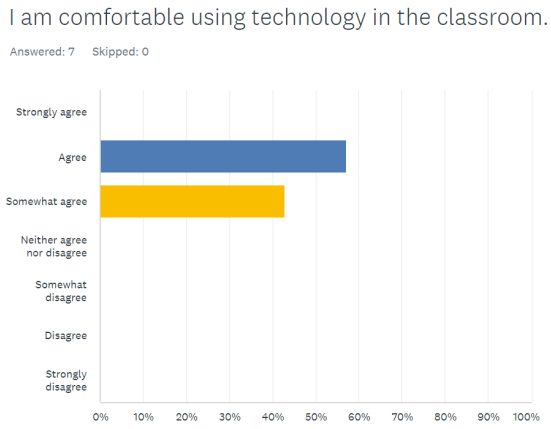
My administrator has an inspiring vision for the future: eventually, she would like each student in the school from grade 3 on to have their own class tablet, to be stored in their homeroom. She personally prefers tablets to computers, because of their simplicity and customizability, and sees a one-to-one student-tablet ratio, with tablets regularly replaced as they become outdated, the goal. The school is actually in the process of implementing a pilot program with its current two third grade classes, though it has yet to be put into action; the tablets have been acquired, but setting them up has taken longer than foreseen. If it goes well, however, the program will be expanded into other classrooms, until it becomes the standard school-wide.

Currently, there is a set of 53 tablets at the school that teachers can "reserve" in advance (outside of the 64 tablets being used in the pilot one-to-one program). However, with roughly 500 students at the school, there are not always enough tablets to satisfy demand. And since students are not permitted to use their own smart devices at the school, the burden falls entirely on the devices the school does have: those 53 tablets and the 30 student computers in the IT classroom, which has limited availability. In fact, the IT classroom is not even available for all of the IT lessons that the school holds; since there is only one classroom and the school holds about 35 IT lessons a week, many of these lessons

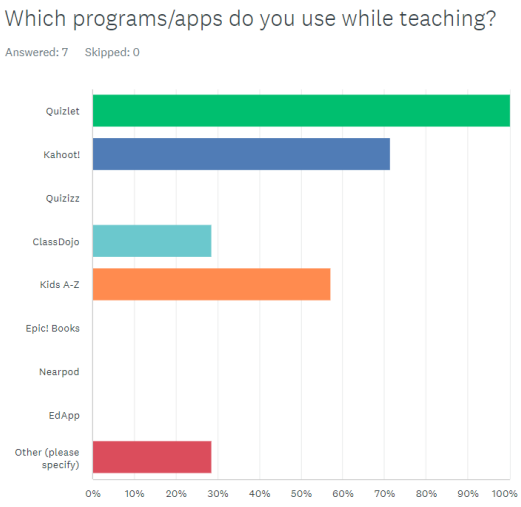
end up being relegated to rooms like the library, and students have to use tablets for these IT lessons instead of the school computers.

The administrator I spoke to also referred to the school's holding of regular teacher trainings on the use of the subscription based educational services the school pays for, namely Quizlet and Raz-Plus. There are also a couple of teachers who are especially familiar with these programs who are available to help new teachers out. However, teacher support seems to be largely limited to those specific tools, both of which teachers are required to use on a weekly basis.

Teacher Survey Findings:

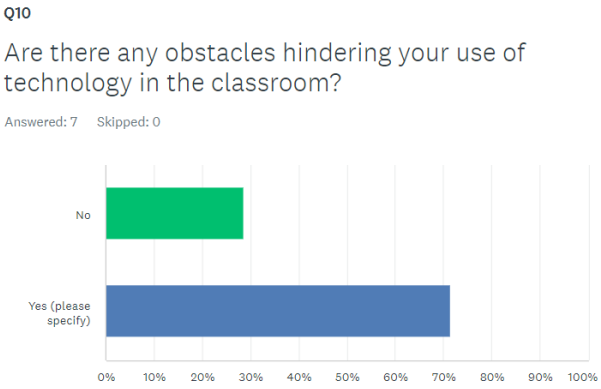


My teacher survey results reinforced what the administrator told me: most teachers have had trainings on Raz-Plus and/or Quizlet, but the training they've received seemed to be limited to these two programs. Overall, teachers felt fairly comfortable using technology, although all of the survey respondents felt they could be more confident.

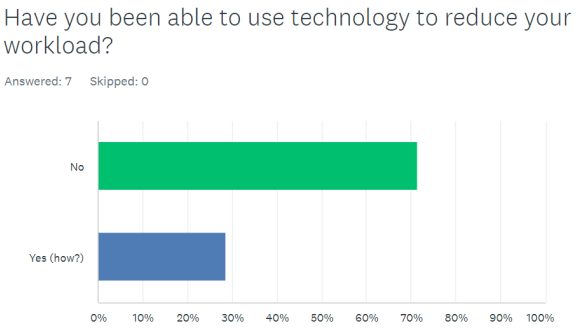


The teachers I surveyed mostly use the same set of educational platforms, with all respondents using Quizlet, followed by Kahoot!, Kids A-Z, and ClassDojo. In terms of tools being used, all teachers surveyed reported using a projector in the classroom, and communicating digitally with parents. Other tools teachers reported using, from most used to least, were using speakers in class, playing videos in class, sending digital materials home, using a smartboard in class, using learning apps in class, classroom management, and students using computers or tablets in class. None of the teachers use an lms.

All of the teachers I surveyed reported using technology in the classroom in most lessons or on a weekly basis, and they all agreed, somewhat agreed, or felt neutral about their use of technology improving their lessons. The most noticeable benefits teachers felt technology brought to their lessons were student engagement and display capabilities. However, teachers did note several obstacles to their use of technology at school; the biggest complaint was the unreliable internet at the school, followed by a lack of devices for students to use, and glitchy tablets.



Most of the teachers surveyed did not feel like they had been able to use technology to reduce their workload, though one teacher mentioned wanting to use it more for assessment to save time. The other way teachers mentioned wanting to expand their use of technology in the classroom was via more tablets at the school, and more reliability among those that were there, so that they could use them more frequently and efficiently in the classroom.



IT Director/Manager Findings:

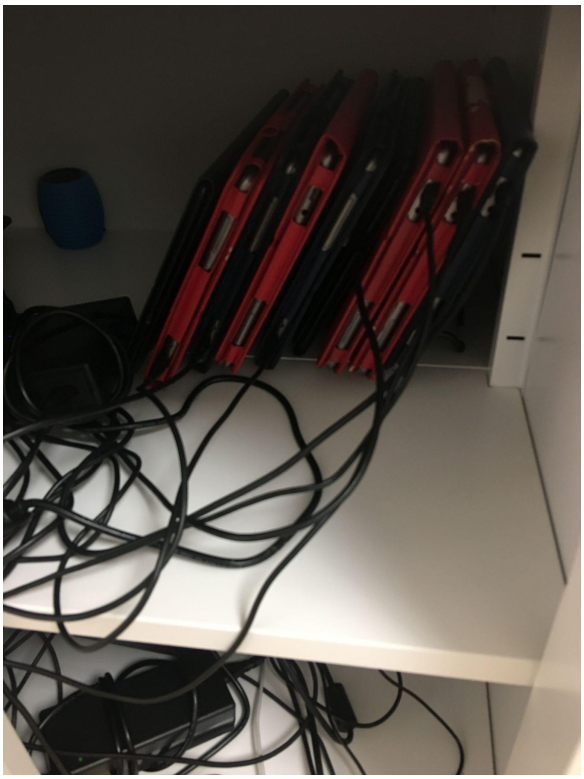
The IT professional I interviewed told me that all public schools in Hungary use the government-controlled eduroam network. The school itself has four switch points supplying broadband to all of the classrooms, each of which has a broadband connection and its own wifi access point. There is one router in the school. School bandwidth varies but at the time of my interview, the download speed was about 81 Mbps and the upload speed was about 16 Mpbs.

The IT professional I spoke to envisioned an educational future in which everything is digital, and paper and pencils are not necessary. This would come along with a

de-emphasis of skills like handwriting and spelling, and a stronger emphasis on digital skills. He sees AI as being an asset to teachers in their lesson planning and teaching, and VR as also playing a bigger role in the future and enabling students to “visit” places they would not otherwise be able to.

He feels that in terms of its current use at the school, technology has been an asset in student language development, displaying materials to the class, and helping students prepare for a digital world. He sees it as a tool that can aid teachers in lesson planning and grading. He also believes that technology provides fantastic opportunities for collaboration among students, and the IT lessons beginning in third grade help students develop important digital skills. However, he notes several challenges with the technology at the school as it is currently. The wifi is unstable, and the tablets frequently malfunction, possibly due to many of them being old and outdated. Teachers rarely have time to plug in the tablets and so they are often not charged. It’s also challenging for teachers to carry a full set of tablets to use in a classroom of up to 33 students. There are also not enough tablets or computers for all of the students to use comfortably.

Above: school tablet with downloaded apps



Right: school tablet charging station

His own role at the school is generally in providing support to teachers when something is not working, and maintaining and keeping up the school devices by regularly checking them. While the wifi does have a firewall and blocks certain websites, the security on the school computers and tablets is quite lax. There is an applock on the tablets, and they require a code that (in theory) only the teachers know to sign in. Therefore, students are unable to use a tablet without the teacher unlocking it for them. The IT classroom is kept locked outside of lessons, and so students can only use those computers during IT class, when the teacher has unlocked the classroom and is supervising. However, there is a generic student log-in code and password that any student can use to log in to any of the computers in the room.

Breakdown:

Currently, my school has a supply of tablets that are available to teachers to use at their discretion, as well as an IT room with computers, though the use of that room is pretty much limited to IT lessons and after-school clubs. Most classrooms come equipped with computers and projectors, and many also have smartboards. This makes it easy to display digital material to the entire class. Teachers at my school are required to use the learning programs/apps Raz-Plus and Quizlet, because the school has paid accounts to both of these services. They are also required to enter grades for all subjects into a cloud-based grading spreadsheet that was set up by the school. Other than that, however, teachers' use of technology is up to them, and varies significantly, both in terms of the extent of their technology use, and the way they use it.

I think that a little more consistency in technology use and application would benefit teachers, students, and parents. If teachers were using the same platforms, it would make comparing notes and holding trainings simpler, as well as sharing materials and resources among teachers. It would give students and parents fewer things to keep track of, learn how to use, and remember passwords for, as it can be overwhelming when every teacher is using a different set of applications and passwords, and a child has 7 or 8 teachers! For parents with more than one child at the school, this becomes even more complicated.

An obvious way I see to make steps towards more uniformity in this topic is in the implementation of a learning management system (lms). Currently, my school has no lms implemented school-wide. There are numerous benefits to a school lms, including:

- It's a great way to consolidate materials; many lms systems are "one-stop shops," which let teachers keep material organized in one place, collaborate with other teachers and students digitally, and communicate with parents. This would streamline things for teachers, as would be fewer systems to keep track of. Right now, teachers use one site for grading, another site for communicating with parents, another site for posting materials, etc. etc. Switching to a single lms would eliminate the need for multiple sites, while there would be a learning curve to any lms implemented, once teachers were familiar with it, there would be fewer platforms to juggle and learn how to use.
- It also simplifies things for parents, especially those with multiple children at the school. If there is a single system for them to receive information from the school, rather than multiple sites and options that vary by teacher and class, it streamlines things, requiring them to remember fewer passwords and sites, and therefore increases the likelihood of their active participation in their child's education.
- Moreover, it organizes materials for students, so that they can find everything they need for school in one place, which can be accessed anywhere. This is especially useful with younger students, who are still learning how to use digital devices in the first place.
- Learning management systems make it easier to personalize learning and allow students to work at their own pace (Bouchrika, 2023). Differentiating classroom instruction is extremely important to successful learning outcomes, and an lms system can help teachers easily adjust their instruction to meet the needs of diverse learners.
- Learning management systems generate a huge amount of data for teachers, thus saving them time that might be spent grading, and providing them with insights into how students are learning and where they are struggling. The teachers can then use these insights to inform instruction.
- Finally, as the pandemic has taught us, it's vital to have some sort of learning system in place if schools need to be closed again in the future. A learning management

system provides an easy platform to host virtual classes as well as create and grade assignments and assessments, and communicate with students and parents.

I would specifically recommend Canvas as an learning management system to my school for the following reasons:

- It's cloud-based, which makes it accessible and convenient, and doesn't require as much technical know-how from IT staff as an on-premise or self-hosted lms (Bouchrika, 2023).
- It's fairly affordable compared to many learning management systems, with a free version available, though we would probably want to go with a paid version and there would likely be maintenance costs. However, it still is relatively cheap compared to learning management systems like Blackboard and Moodle.
- It has a simple interface that is easy for students and teachers to use.
- Moreover, it uses conservative code that is easy for IT professionals to maintain (Kiran, 2021).
- It can run on any device, from any location.

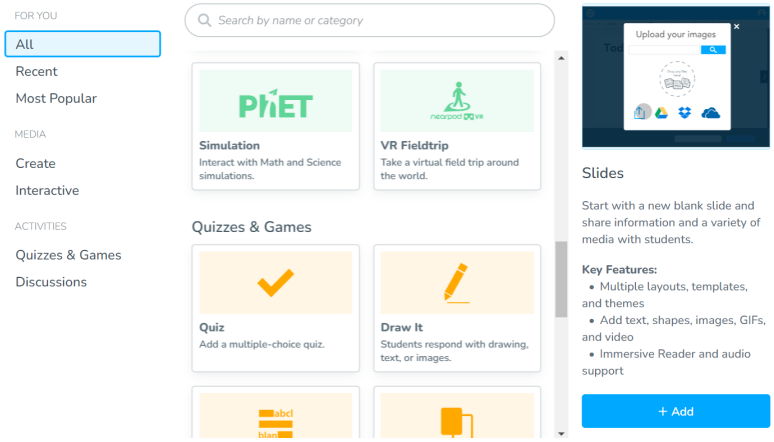
In the long-run, we would need to run trainings on how to use Canvas, especially what to do with the data it generates. Statistics show that 67% of learning institutions are not using lms analytics to their full capabilities (Kim, 2018), so teaching teachers how to take full advantage of this service would be essential.

My interview with my school administrator revealed that the school is currently paying for three educational technology platforms: Twinkl, Quizlet, and Raz-Plus, the latter two of which teachers are required to use on a weekly basis.

I would recommend moving away from a subscription-based Quizlet service that teachers are required to use and replacing it with something more versatile. While Quizlet Plus is useful for sending vocabulary terms home to families, I know from personal experience and from talking to other teachers at the school that very few families actually sign up to join the classes teachers create. It's simply one more account for parents or students to create, along with usernames and passwords, and Quizlet's application is fairly limited. Generally, students just use the sets without creating an account, which doesn't allow the teacher to track student progress. If sets are made private, students just don't use them at

all. Moreover, Quizlet's application is fairly limited; while it works well for matching exercises, it doesn't do a whole lot more.

I think that the budget the school uses on Quizlet could be much better applied elsewhere. My personal recommendation would be Nearpod. Not only can Nearpod be used to create quizzes like in Quizlet, but its application extends far beyond: teachers can use it to create individual activities, or put these together to create interactive lessons. Nearpod offers several elements to include in these lessons, including slide decks, VR "field trips," polls, open-ended questions, collaboration boards, videos, 3D simulations, standard quizzes, matching and memory games, Flip videos, drawing activities, fill-in-the-blank activities, and, typically students' favorite, a Time to Climb quiz-based game. It is also really easy to run these lessons via Zoom or another online meeting platform, which is an added benefit if the school needs to move to virtual learning at any point.



Above: just a few of the activities Nearpod lessons can include

Like Quizlet, Nearpod can be used in the classroom or at home; however, users never need to create an account, but can simply enter a lesson or quiz by typing in their name. This removes a big obstacle to student use. Nearpod then generates beautiful, very thorough reports on student performance based simply off of the entered names. I know from past experience that I had much more student engagement with the Nearpod sets that I sent home than I did with the Quizlet sets. Students also reported the Nearpods being more "fun." Though there is a free version of Nearpod, its storage space is extremely limiting, so I would recommend my school put the money it spends on Quizlet towards a premium Nearpod account for teachers to use.

Of course, this would require training. While Nearpod is fairly intuitive and easy to use, none of the teachers I surveyed currently use Nearpod, so it would probably be new for most of the staff at my school. To help teachers understand the full potential of Nearpod and how they can best utilize it in their teaching, I would like to hold a teacher training on the different services Nearpod offers, and how to use them.

I would also recommend that my school expand its Raz-Plus subscription to include the ELL edition. Nearly all of the students at my school are not native English speakers, and one struggle teachers have with using Raz-Plus is that the comprehension questions and worksheets that the platform provides to correspond with each book are far too advanced for our students. The ELL edition of Raz-Plus includes WIDA, TESOL, and CSS-aligned resources designed specifically for ELLs, to help students develop tier 2 and 3 vocabulary as well as basic social and survival vocabulary (Learning A-Z, 2023).

Finally, I would extend trainings to other platforms beyond Quizlet and Raz-Plus. My teacher survey and administrator interview both confirmed that really the only platforms teachers have received instruction on how to use are the two listed above. Teachers receive repeated training on these two platforms; I know that I personally have been using Quizlet for over 5 years, and have been required to attend repeated trainings on how to use it. More useful, I think, would be to broaden the types of trainings offered at the school. I would recommend the school offer some sort of instruction on a variety of technology that teachers can use in the classroom, such as EdApp (which none of the teachers I interviewed were familiar with), ClassDojo (which some teachers know about but others do not), Quizziz (which none of the teachers were familiar with), and Epic! books (which none of the teachers were familiar with). Introducing teachers to a variety of platforms and tools that could help enhance their teaching would give them the opportunity to pick and choose options best suited to their students' needs.

I do fully stand behind my administrator's vision of a full set of tablets for every classroom, so that each student would have his or her own personal school device. I think this would reduce, if not eliminate several of the issues that the teachers and IT professional brought up, including the difficulty in carting tablets back and forth, charging issues (because each child would be in charge of charging his or her own device), and students forgetting their log-in information for various sites and apps; they could simply stay logged in to these

accounts on their own tablet. Teachers would not have to worry about reserving sets of tablets in advance either. While my school administrator did not have a preference in terms of tablet brand, investigating the current tablet market leads me to recommend the Samsung Galaxy Tab A7 Lite. This is a relatively affordable tablet, and has been described as one of the "best cheap tablets" on the market (Murray & Cipriani, 2023). Like most schools, budget is a concern for the school I teach at, so affordability is key. However, it's important that the tablets also perform well to maximize their efficacy, especially as multiple teachers surveyed cited "glitchy tablets" as an obstacle to their using technology in the classroom. The Samsung Galaxy Tab A7 Lite has an all-day battery life, which acts as an added safeguard against the uncharged tablets that the teachers and IT professional I interviewed complained about. Furthermore, it is lightweight, making it easy for teachers and students to move from classroom to classroom, and unlike some tablets, has access to Google's apps and services (Murray & Cipriani, 2023).

I would also recommend more desktop computers be purchased for IT lessons. I think a second IT classroom would be a huge benefit for the school, so that every IT class could be held in a proper IT classroom. Right now, about half of the IT lessons are held in other classrooms on tablets, and the tablets don't have Microsoft Word or PowerPoint or Paint or many of the other tools the IT curriculum requires students to learn. Moreover, the wifi on the tablets is far glitchier than the broadband connection the computers in the IT classroom use, and there are the usual issues with tablets not being fully charged. A second IT classroom would ensure that all students receive the same IT experience, and less time is wasted troubleshooting tablets. I would stick with the same Dell computers that are used in the current IT classroom, , as the IT professional was happy with how they've performed thus far, and it also would ensure consistency among all IT classes.

The wireless internet at the school is clearly an issue that is affecting learning; teachers and the IT professional I interviewed cited it as a major frustration. The bandwidth of the network seems somewhat low; right now our upload bandwidth is about 81 Mpbs, with one access point per classroom. According to John (2019), this is sufficient for basic classroom requirements, or to "facilitate basic and media-rich assessments or classroom use, but not all classrooms at the same time." However, if we want to achieve the school's vision of a one-to-one student-device ratio, a higher bandwidth and greater frequency of access points is necessary. For a school with widely-available technology and a significant digital

curriculum, with internet readily available whenever students and teachers need it, John (2019) recommends a network with 1.2 access points per classroom and 1 Mpbs per student bandwidth. This means our school falls short on both access points and bandwidth, as with roughly 500 students, our bandwidth would need to increase over six-fold to reach 500 Mpbs. I would recommend the school investigate alternative networks with higher bandwidths, or at the very least increase the number of access points and routers in the school.

Conclusion:

So, overall, there are five long-term steps I would recommend to the school:

1. Integrate Canvas as a learning management system
2. Move towards using Nearpod instead of Quizlet
3. Further develop a one-to-one system of class tablets, so that eventually each student at the school has his or her own tablet to use in the classroom
4. Increase the network bandwidth and number of access points at the school
5. Hold trainings on a variety of new educational technology platforms and tools, instead of running the same trainings on the same tools repeatedly

In terms of immediate next steps, I would recommend first calculating the potential cost of Canvas for the school (overall cost + licensing fees, maintenance costs, upkeep fees, any additional fees for support and upgrades/updates). Afterwards, I would recommend meeting with the school IT professional to check if Canvas is compatible with the current school software and apps. If so, I would schedule a meeting with the school administration to discuss the benefits an lms, specifically Canvas, could have for the school, and see whether the school would be willing to implement it as an lms.

I would recommend holding an initial training session on how to use Nearpod; there is a free version of the platform that teachers can try out, and I think introducing them to it would be a good first step towards adopting a school subscription. After teachers have been using Nearpod for a few weeks, I would recommend surveying them on their experiences with the platform, and any advantages and disadvantages they see to using it.

I would recommend interviewing the two teachers who are running the pilot one-to-one tablet-student program in their classrooms after it has been running for about a month. I would ask them how they have been using the tablets in their lessons, if and how it has affected their lessons (positively or negatively), and what challenges or obstacles they have faced. Learning more about how this system is working would give me more data on how best to implement it throughout the school over upcoming years.

Finally, I feel like the data I gathered for this report is missing a huge part of the equation: the experiences of the school's students and their parents or guardians with technology in the classroom. I would recommend surveying at least 20 students and 20 parents/guardians about which technological tools have been most effective/helpful/exciting/frustrating/challenging/etc. in their time at the school, and whether they would like to try any other forms of technology or different ways of integrating technology into the curriculum.

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