

# International School of Lausanne: Integrating Multiple Platforms in a 1-to-1 School

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**Abstract:** We discuss the specifics of technology integration in a private international school, where a range of hardware and software solutions are deployed depending on the age of students. We present some of the challenges – both technical and human – associated with a 1-to-1 model. Finally, we comment on the experience of inviting university researchers into a normal classroom.

**Keywords:** school, technology integration, 1-to-1

## School general context and infrastructures

The International School of Lausanne (ISL) is a not-for-profit, English-language day school that offers all three International Baccalaureate (IB) programmes (Primary Years Programme - PYP, Middle Years Programme - MYP and Diploma Programme - DP). The school is in the small town of Le Mont on the northern edge of Lausanne. ISL have served the local and international community since 1962.

At present approximately 720 students are enrolled and the school comprises of the Primary School (ages 3-10), including the Early Childhood Centre (ECC); and the Secondary School, made up of the Middle and High Schools (ages 11-13 and 14-18 respectively).

ISL is currently undergoing an expansion project, to be completed in 2015, with an expected final enrolment of 990 students. Classroom sizes vary between 16 and 24 students per class (even smaller in some optional subjects in the final years).

Since the 2013-2014 academic year, ISL launched a Technology for Learning program (also commonly known as a 1 to 1 program). 1 to 1 models throughout the school differ depending on the age and educational needs of the students. The various 1 to 1 models ISL has in place are highlighted below:

- ECC classes have Technology classes once a week where students are initiated to the iPads.
- Year 1 and Year 2 classes are on a 2 to 1 device ratio using school owned iPads. 2 students share the same iPad
- Year 3 and 4 classes are on a 1 to 1 device ratio using school owned iPads. iPads stay at school only and are used during the school day for any school related activities.
- Year 5 and 6 classes are on a 1 to 1 school owned laptop program. Laptops stay at school only and are used during the school day for any school related activities.
- Year 7 to 11 students are issued a school owned laptop that can be used both at school and at home for use during the school year only. Students are required to bring and use the school owned device to school and to all classes every day.
- Year 12 and 13 students are required to bring their own laptop or tablet PC (BYOL program – PC or Mac) to school using VDI (Virtual Desktop Infrastructure) technology to access the school network, internet and educational applications via a Client.
- All teachers (and some administrative members) are issued a school owned laptop that can be used both at school and at home while employed by the school. ECC to Year 4 teachers also receive a teacher iPad.

All school owned devices, including VDI Virtual Machines are connected to the ISL network wirelessly giving all users access to network as well as online resources. Internet filtering has been put in place to monitor all network and internet traffic at school. Additionally, NetSupport, a monitoring software (1), is installed on all student laptops in order to monitor and manage any online class activities while on campus.

Table 1: Inventory of the number of devices managed at ISL

Model	Qty of devices
ECC to Year 4	148
Year 5 and 6 total	80
Year 7 to 11 total	240
Spare student laptops for Yr 5 to 11	50
Year 12 and 13 total	130 VMs
All staff total (teachers and admin)	193
Creative digital media labs (iMacs)	54

As far as classroom technology is concerned, the majority of classrooms are set up with a docking station connected to the classroom AV system (monitor, beamer and speakers) and local area network via Ethernet, which allows teachers to dock and use their laptops in any classroom they wish. Primary classrooms include Apple TVs. Most classrooms are equipped with a WiFi access point to cater a maximum of 25 clients connected to the ISL network in each class.

### Integrating different technologies

With such a variety of systems in place, there is a need to centralise storage and common documents so that all involved stakeholders can access resources.

Each student and teacher is given a personal storage space in the server (home drive or H drive). There are also a variety of shared network drives - for teachers' internal documentation, for administration purposes, etc. There is also a Public (P) drive where teachers can provide resources for their students and create drop boxes for assignments. All these network drives are backed up periodically.

Since our servers are Windows-based, there have been some challenges to allow access to these on other devices. The Apple Macs run a script that mounts the network drives on log in, and dismounts them at the end of the session. The iPads, on the other hand, use the WebDAV protocol to connect to the network storage.

One positive feature of school-owned devices has been the possibility for teachers and students to access their network drives from any location, using Direct Access (2). This has replaced our previous web-based access system, which was cumbersome and gave lots of errors.

For students in our BYOD programme, we quickly identified the need to provide access, not just to their network storage, but to a range of applications that they may not have on their devices, such as current versions of office software, creative applications (Adobe Creative Suite) and subject-specific applications. The solution we implemented was a Virtual Desktop Infrastructure (VDI). Students logged on to a Virtual Machine running Windows, which contained the same software as the school-owned devices as well as being connected to the network storage. The deployment of the VDI has been a trial-and-error process; there was quite a lot of backlash from the student body, especially when it was set so that it was the only gateway to internet access (i.e. no direct connection from their device).

We are currently trialling out the next version of the system, which will allow the students access to the internet and the printing server directly from their machine. The latest version of our VM software also allows the deployment of "virtual apps", which the students can run natively on their machines without having to connect to a full remote desktop. The whole process has involved quite a lot of dialogue between teaching staff, technical staff and students, in order to identify what best suits the educational needs of the school in terms of software provision, ease of access for students, and ease of management for the technical team.

Another line of thought is the use of cloud storage. The school is heavily invested in the use of Google Apps for Education (GAFE), and students get introduced to using Google Docs and Google Sites quite early on. The

advantages from an educational point of view are many: real-time collaboration, no need for saving and backup, easy distribution and collection of content between students and teachers... There is also a growing ecosystem of teaching tools based around GAFE. The use of GAFE is slowly growing for communications between faculty, although there is still quite a reliance on paper copies or MS Office files sent by email. There are some concerns about privacy and safety of our storage, since the documents no longer reside in our servers.

The current expansion of the school will bring new challenges, in terms of managing a larger number of machines and connections. The range of systems in place also poses the question whether it is best to allow different teachers to “go their own ways”, or to specify the platforms to be used in all lessons.

## Using technology in the classroom

The integration of technology in the physical space of the classroom brings its own challenges, some of which have tried to be addressed at ISL as part of our expansion plan.

The classroom space is best suited for “traditional” teaching style - a teacher at the front and the students forming an audience. From a technological point of view, this involves a projector pointing to one of the walls of the classroom, which is connected to a computer that is placed on the teacher’s desk. As a result, when teachers try to alter the layout of the room, there are concerns about students facing away from the projecting screen, or the teacher being constrained to a position in the room.

We are currently experimenting with the use of wireless projectors that allow the teachers to connect remotely to the projector from whatever position. Alternatively, our classroom monitoring software (NetSupport) allows the teacher to broadcast their screen (or that of one of the students) onto all other computers in the classroom - this functionality is not yet widely used.

In terms of usage in the classroom by teachers, we have seen a significant increase since the introduction of our 1 to 1 programme. A recent survey (October 2014) among teachers between years 5-13 (where laptops have been introduced), showed that almost 90% of teachers used laptops at least in some lessons, with approximately 50% saying that they used them in most lessons. The most common tasks that computers were used for were productivity (office applications), research, and some specialist software.

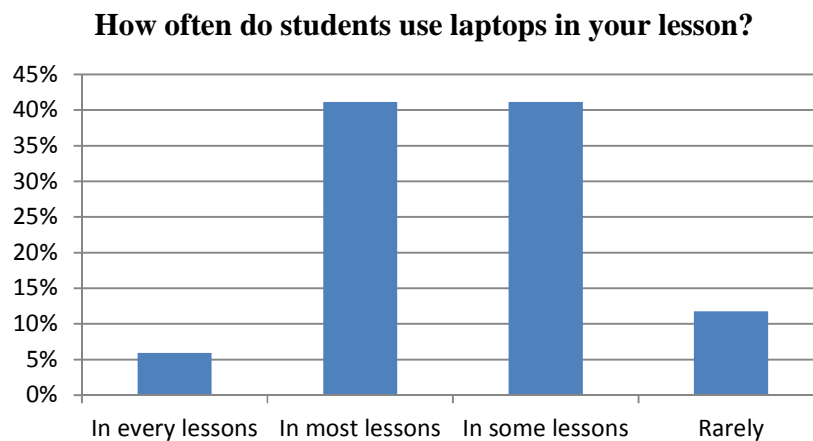


Figure 1. Teachers’ perception of laptop use in class

In order to support the use of technology in the classroom and explore ways to further its integration, the school created a Technology for Learning (TfL) committee. This is a voluntary group, including a range of teachers with different levels of expertise and interest in technology. The group was actually established before the 1 to 1 programme was implemented, and acted as a steering committee to investigate the possible implementation models, analyse how they had been applied in other schools, and make a recommendation about the expansion of the computing programme. With the programme well in place, the committee still meets regularly to discuss changes to the provision of technology in the classroom, difficulties that arise in practice, and to make proposals to the school leadership team about the use of computers in school.

For the day-to-day practice, the school has two Technology Integration Specialists (TIS) - one for the primary section and one for secondary. Their role is to assist teachers when they want to use a particular tool in class - whether by planning the lesson with them or actively going into the classroom. The TIS also provide guidance on different technologies that teachers can use; assist students when they want to use specific software for their projects; and coordinate (together with the Head of IT and the leadership team) the Digital Citizenship programme that is part of the pastoral care for the students.

The amount of technology used in classrooms has increased, as well as the types of technologies being used. Current areas that the school is exploring involve communicating what goes on in the classroom (e.g. using social media), finding uses for mobile technology in lessons, and promoting digital citizenship habits among students and parents.

## **Research in practice: collaboration with EPFL**

Our school was contacted by a research group at the Ecole Polytechnique Fédérale de Lausanne (EPFL) in the fall of 2014 looking for participants for their research project CHILI (Computer-Human Interaction for Learning and Instruction).

The purpose of their research is to try to develop ways to integrate more traditional pencil and paper and use of objects by utilizing digital technology for learning more seamless for the teacher. After we had an introduction to some of their research products one of us (WF) decided to offer her students as a trial group. Two year 7 (11-12 years old) mathematics classes participated, which involved about 44 students. They liked having something a bit different to explore mathematics with and often did not realize how much collaboration they were doing.

The experimental phase involved researchers from EPFL coming into the lessons and deploying their devices ("lamps"), and leading the students through a lesson involving paper manipulatives to learn about fractions. In a subsequent session, the class teacher conducted the lesson while wearing eye-tracking goggles.

The minor problems that occurred while participating in the research were: finding space to use as our campus is currently undergoing expansion and construction; taking the time to set up the lamps; trying to complete the session in the time allotted as secondary operates on a fairly strict timing; providing additional materials for the students to work on while they participated in the activity while they waited their turn.

A more significant problem was altering the timing of the curriculum as some topics had to be condensed, added or some planned assessments removed. Since the initial phase of the research involved learning about fractions with the use of digital technology some fractional concepts were introduced that were not initially planned by the teacher and some topics about number properties were removed. As a result, a planned assessed task had to be removed, as this related to concepts that had not been explained in class.

New technology can also interfere with existing systems. As part of the research involved wearing the eye tracking goggles while the students were using geometry software on their laptops, it was not suitable trying to utilize "NetSupport" for demonstration purposes at the same time. It will be part of the teaching and learning process to learn how to incorporate new tools into the workflow in place. However, hopefully, in the long term the benefits of the students having the experience of being involved in the research process will outweigh the consequence of missing out on topics or assessments.

## **Conclusions**

The use of technology in the International School of Lausanne has increased substantially over the last few years. It is now an integral part of the pedagogy in the classroom, and there is a wide range of tools available for the entire school community to use in their work. Educational technology is a rapidly changing field, and therefore the school makes a conscious effort to keep revising its policies and adjust them to the needs of our students and teachers. Our recent collaboration project with a research institution provides yet another angle that we can tackle to make sure that the provisions made are always up to date. It is impossible to predict what technology will offer in the next few years and how it will affect the classroom environment; indeed, the use of technology by our students has changed rapidly and there is an expectation to be "always on, always reachable". We aim to keep abreast with new developments, while keeping the most important element - the learning of our students - well in the centre of our mission statement.

## Endnotes

- (1) NetSupport School - <http://www.netsupportschool.com/>
- (2) "DirectAccess in Windows Server" - <https://technet.microsoft.com/en-us/library/dn636118.aspx>

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