

BUILDING LEARNING LABS AND INNOVATIVE LEARNING SPACES

Practical guidelines for school leaders and teachers

Case study PORTUGAL

Sala de Aula do Futuro at Dom Manuel Martins
Secondary School



This case study complements the European Schoolnet's publication "**Building learning labs and innovative learning spaces - Practical guidelines for school leaders and teachers**" (2019). Find the full report and other case studies here: fcl.eun.org/guidelines

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Background and Inspiration

Dom Manuel Martins Secondary School is a general secondary school located in Setúbal, a Portuguese coastal city which was the centre of Portugal's fishing industry at the beginning of the 20th century and today attracts many tourists. The school is in a poor neighbourhood of the city and therefore needs to respond imaginatively to a number of challenges and obstacles. The school opened in 1996 and in the school year 2016-17 had 600 students and 75 teachers. The use of ICT was already advanced when the lab was set up because the school runs professional ICT courses which had increased the use of ICT by the whole school.

In 2012 Carlos Cunha, a teacher at Dom Manuel Martins Secondary School, was attending a workshop related to the Scientix project¹ at the European Schoolnet office in Brussels which included activities in the Future Classroom Lab (FCL). Carlos recalls: *"My first impression was: Wow! I was astonished by the space and the possibilities that kind of environment could offer for classes and a whole lot of ideas came into my mind."*

Carlos was inspired by the combination of the way the space was organised, the technologies available and the innovative pedagogical approaches that were being explored. The chairs were not set out in rows, so that different work could be carried out by different sub-groups of students. The technology in the room was also clearly attractive to students and likely to increase their engagement.

Planning

Getting started

The school did not start building their own learning lab immediately after Carlos was inspired by the FCL in Brussels. Carlos explained this was because *"it took about two years to find, and agree our relationships with, all the sponsoring companies that we needed to work with us and support us."* At an early stage the school sought advice from the University of Lisbon's Institute of Education, which was a partner in the EUN iTEC project and involved in setting up a similar space. Carlos commented: *"It was very nice teamwork; they were building a learning lab for university students and we were building one for secondary school students so our projects were complementary."*

The Sala de Aula do Futuro opened in April 2014 and the Future Teacher E-ducation Lab at Lisbon University Institute of Education opened in June 2014. These were the first two labs outside of Brussels but Carlos recalls: *"In the beginning I only had a 49m² room with two interactive whiteboards and four chairs."*

Obtaining funding

The school did not have much money to spend, so 75% of the equipment had to come from sponsoring companies. It took a long time to secure this sponsorship. Carlos emphasises that *"it is*

¹ <http://www.scientix.eu/>

most important to find the right person in any company you hope to work with. If you just send an email it goes into the garbage. You need to make personal contact with the right person and this takes time, research and perseverance.” However, “the truth is that most of the companies involved in education are very willing to cooperate in building these kinds of spaces, especially if you can keep them visible in the media because it is a way of publicising their brands and the image of their company. Also, we have students who, if they get used to a company’s products at school, may be their customers in the future.”

The school also received support from the Ministry of Education.

Drivers and Aims

The most important aim was to improve academic outcomes for the school’s 13-15-year-olds. The lower secondary school students were not achieving good results and Carlos and his colleagues concluded that old “talk and chalk” methods were not the right answer for them. The school is in a poor neighbourhood where most parents did not excel in education themselves and tend not to encourage their children to study. The school hoped that by changing teaching and learning methods it might be able to change mindsets and as a result improve educational outcomes.

Stakeholder engagement and involvement

Teachers were the main local stakeholders involved in the planning process. Carlos found that it was very difficult to involve parents as their participation in their children’s schooling was generally very low, e.g. typically only 2% of parents attended parents’ evenings. At end of the year the school invited some parents to visit the learning lab and see how it was used but these were only about 1% of the parents. The university and corporate partners were the stakeholders most actively involved in the planning and initial implementation stages. A large amount of advice and support was provided by the first two or three companies involved. Eventually 32 companies became partners but Carlos remarked: *“The first companies were very courageous as we only had an empty room to show them.”* The school did not seek support from local or regional education authorities. However, it did receive logistical support from the Ministry of Education. The MoE had to approve the school’s plans so it tried to engage them by offering the lab to them for workshops and meetings. The school also had a written agreement with the MoE to show to potential sponsors to reassure them that the lab was an official project and not just a whim of an individual teacher.

Implementation

Carlos’ project managed the process of setting up the learning lab and received support and advice from the FCL in Brussels. He says: *“During that time I was going to Brussels quite a lot regarding the Scientix project and they invited me to share in workshops. I was always getting and sharing ideas and FCL staff were very aware of what I was doing and provided advice.”* However, at that time the resources on the FCL website, including the FCL Toolkit, were being developed so they were not yet available to use.

Convincing and training the teachers

All the teachers in the school had a 10-hour workshop, including developing Learning Stories and learning how to implement these as well as training to use different technologies and apps. Carlos observed that *"the [pencil metaphor](#) describes very well what happened with teachers in my school."*

He explained: *"In our school ten to fifteen teachers thought the learning lab was a good idea, 20 to 30% thought it was a very bad idea and would achieve no good results at all, and others were waiting to see what happened."*

Carlos has trained more than 300 teachers in the classroom between 2014 and 2018, including workshops and 25 five- or six-hour training courses. He noted that the pencil metaphor applied to all of the groups of teachers involved, even teachers from other European countries on Erasmus+ courses who attended two- to three-hour workshops. The reactions were always the same. Five said: *"Fantastic I want to do it"*, five said: *"Oh, I don't know"* and fifteen said: *"Maybe I would use it once in a while if we had one."*

Carlos reports that, after four years, half of his school's teachers use the lab, but the other half do not. He concludes that *"changing the minds of the teachers is very hard and takes a long time."*

Some training in the use of specific technologies in the learning lab has been provided by the commercial partners who provided the technology. Regarding using the technologies in teaching and learning, the school has used and learned from Learning Stories developed from future classroom scenarios provided by the iTEC project.²



² <http://itec.aalto.fi/learning-stories-and-activities/>

Convincing IT and administrative staff

Carlos also needed to convince IT and administrative staff. The Principal told them to support the learning lab, but they did not really believe in what the learning lab was about or that student-centred methods are effective. So it was hard to get their support. However, two ICT teachers were very helpful and over a few years some other staff changed their minds, but others did not.

Impact on technology use across the school

In preparation for the learning lab the school had to set up various IT platforms. Some of these are available outside the learning lab and all teachers are starting to use the new systems. If the learning lab had not been created, the teachers would probably have continued just using Moodle. Now there is much more technology in use in the school including cloud-based systems.

Setting up the physical space

The school's aim was essentially to clone the FCL in Brussels. At first the room was set up with five different-coloured learning zones (Create, Develop, Investigate, Exchange and Present). Then in 2016 a sixth zone, the pink Interact zone, was added outside the main room with round tables and an interactive whiteboard.

Lighting, acoustics and noise

In the big room with the five zones, the existing lighting was good but in the sixth zone a sponsoring illumination company provided lighting that is constant, computer-assisted and optimal for working. The floors in the two rooms are sound-absorbent, which avoided almost all potential acoustic problems.

Impact on space design throughout the school

The first room to be completely refurnished after the lab was the library and this was inspired by lab. Then, after the sixth zone had been set up, the school started setting up other classrooms without rows of desks. Initially most teachers did not like this and put the desks back in rows. However, ten teachers kept the students sitting and working in groups.



Moving, re-purposing or adapting existing furniture and equipment

The implementation team collected items from other rooms and from around the school to furnish the learning lab, e.g. chairs, interactive white boards and tables. They found some computers in storage and a video camera with a tripod in the library. For the sixth learning zone, the team took tables and chairs from a stock room and painted them themselves.

Piloting

The school started with a group of teachers working with two classes of 13-year-olds; they were the pilot group in the first year who shared their experiences with other teachers.

Summary of key steps to create a learning lab

- Obtain the support of the school principal
- Find a large room in the school, at least 8 x 6 metres
- Get the support of a group of teachers
- Try to get help from national companies
- Try to get financial support from your town
- If you can involve a university, so much the better
- Make an investment plan for purchasing equipment over three or four years but make a start with equipment and furniture already around the school
- The first investments should be for decor, the room should be attractive and comfortable – including the floor and the chairs
- If the room is on the ground floor, it may be necessary to increase security as the room will contain valuable equipment

Start-up phase lessons learned

- It is very important to get to the right person in the companies you hope to partner with
- It is very difficult to change teachers' mindsets so it is a very slow process and you cannot teach if you do not change the way you access the students
- It is hard to convince teachers that it is possible to do things differently, e.g. introduce project or inquiry-based learning, and still have students ready for the exams in time.



Using the learning lab

The learning lab is available to all teachers, teaching all subjects and age groups. The teachers who have been using the lab most grow more confident with the technologies and methodologies the more they use them. However, this group has not grown as much as Carlos had originally hoped and is still only about half of the total number of teachers.

Technology in the future classroom

The technology currently available in the learning lab includes: robotics, 3D printing, 3D scanning, chromakey (green screen) lab, science lab, tablets, interactive white board, interactive table, computers. Also, while planning the learning lab, the school noticed that nearly all the students, including those from poorer families, have mobile phones and/or tablets. Therefore, the school has tried to integrate their use into the learning lab and to show the teachers and the students that they can be used for learning.

The classroom has a dedicated Internet connection separate from the rest of the school. Experience told Carlos that using the school Wi-Fi would greatly increase the probability of failure due to teachers' and students' frustration with slow Wi-Fi. Therefore, the school bought very highspeed broadband just for the learning lab.

Management and technical support

One teacher is responsible for managing the lab. Teachers who wish to use the lab go to the calendar and book a time slot. Equipment maintenance and technical support is provided by the school's ICT teachers.



Impact

The benefits of the learning lab

Carlos reports: *"The change in the students has been the difference between day and night"* and that after starting to use the lab they approach school in a different way.



He added: *"The two classes in the pilot improved their results, not by a lot but it is a start"* and *"the initial benefits were very contained within the pilot groups."* However, there has now been a very high impact on the way the teachers using the learning lab are working and using the resources. Also, *"in their regular classes, even where they are still using rows of tables, teachers have changed their methodology and the tools used with the students."*

Some teachers are using more inquiry-based learning, project learning and group learning and Carlos believes that in time this will change the way they want their classrooms to be set out. Increased collaboration between teachers has also been noted. The teachers have had to collaborate more since, when students had questions about new applications, the teachers had to ask their colleagues for advice.

Impact research

The school is working with the University of Lisbon, including cooperating with doctoral theses focussed on the school and other learning labs. The research includes ten lessons taught in the learning lab, and in traditional classrooms for comparison, with three or four cameras used to study the teachers and students throughout the lessons. The results will be available in 2020.

Unexpected results or consequences

Teachers working with different apps and in different ways in their own classrooms was an unexpected positive outcome of building the learning lab. However, Carlos reported that it is difficult to persuade some teachers to try the learning lab as they do not see themselves working in this new kind of environment. Another unexpected aspect is that these hard-to-persuade teachers are not always the older ones. Some are very young and just starting out in their careers. Carlos concludes: *"It is not a matter of age, confidence in using technology is needed and many teachers don't like it when students see that they don't have this."*

The future

Desired additional support

Carlos judges the tools on FCL Brussels site to be very good and helpful. However, it would be better if more of the resources were translated into more languages. He suggests that a collaboration between EUN FCL and other projects could help to complete this translation work and notes that, as Portugal now has about 150 labs (active or in development), Portuguese should be one of the languages.

Three key pieces of advice for other schools

- Patience
- Determination
- *"You have to have a way of accepting – for me this is the main lesson – you have to accept that changing minds takes a lot of time. You think it's such a good idea that every teacher will change in maybe three years but really it will take five to ten years, things will not change from one year to the next."*

Information about the publication

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