Lab Stories

Project-based learning in Reggio Emilia

LabLearning evaluation

www.lablearning.eu

Team LabLearning
Dipartimento formazione e apprendimento
Scuola universitaria professionale della Svizzera italiana
Locarno, Svizzera
www.supsi.ch/dfa

SUPSI

PART I

The *'Lepida Scuola*' concept and LAB descriptions

This report presents 2 Labs that were carried out in Reggio Emilia under the coordination of Enzo Zecchi, in two different high schools: Pascal and Einaudi. Both labs were inspired by the *Lepida Scuola* concept.

The Lepida Scuola Concept

Lepida Scuola is a conceptual framework of project-based learning at school, developed and promoted in Italy by Enzo Zecchi.

In its maximum extension, *Lepida Scuola* confronts the problem in its integrity. The basic idea is transferring the consolidated theory of project management to the classroom, with one important difference: in the classroom, the final product is less important than the learning process. During the Labs, It was applied to simple projects and was aimed primarily to teachers who are approaching project-based learning (PBL) for the first time.

At school, in fact, projects are not carried out for business, but to foster the development of students' skills and knowledge-building. To ensure an effective transfer, teachers must be meaningfully equipped; they must have references that replace those present in traditional instruction, based on transmission. This is a crucial aspect: identifying the fundamental activities and the products required (deliverables), which in these passages must be realized by students and teachers. The teacher thus regains a system of coordinates that gives her orientation and prevents her/him experiencing a kind of entropy that is disorientating even though necessary and educational. Therefore, teaching with the help of projects becomes possible, and practicable for fostering the development of 21st century skills.

There is well-known problem that must be examined: it is quite simple to push the students to "do", but it is difficult to guarantee and verify their thinking during the action. *Lepida Scuola*, with its steps and deliverables, attempts to respond, albeit limitedly, to this problem.

For this reason it is strategic, if possible, to have all deliverables shared on an Internet cloud platform accessible to instructors and students, as this allows them to overcome space-time barriers. All project materials become available at school, at home, and any other place with a computer, tablet, or smartphone and an Internet connection (the platforms of choice for these activities are, for example, the free suites of Google Apps, Zoho, etc.). This will allow students to continue collaborating with their groupmates even outside of school.

Lepida Scuola understands PBL as referring to projects characterized by a life cycle that develops in four phases: Ideation, Planning, Execution and Closing/Evaluation. It proposes a structured and meaningful path for developing these phases in the school setting. The method is not confined to carrying out projects, but is also valid in the case of simple activities. For these too, it is important to educate students towards a method: thinking before doing; getting organized; doing; and reflecting on the outcomes of the action.

The first Lab at Reggio Emilia BUS Pascal

Paola Turci and Silvia Ovi are teachers that adopt a primarily transmissive approach in their subjects, namely Electronics and English. However, they were open to new experiences, and decided to collaborate with Enzo Zecchi to apply *Lepida Scuola* (LS) to a joint project on Electronics using English as language of instruction.

As part of their Electronics program, students learn to use a professional software package bought by the school for the design/simulation of electronics circuits (National Instruments' *Multisim*). The goal of the project assigned to the class by the two teachers was to explore alternative software solutions for the same purposes but in the Free and Open Source domain (FOSS); assess their characteristics; and make recommendations about their future use in the school.

To carry out the project 6 groups were formed with 3 participants each. Three other students were assigned transversal support functions to their colleagues: one is multimedia coach (for editing the presentations envisaged at different stages of project development); one is a technical coach (on software aspects); and the last one is a 'facilitator' coach (to support group work dynamics, smooth out problems, etc.). The students assigned to each group and the three coaches were all chosen by the teachers, with the aim of balancing both students' capabilities (especially in English and Electronics) and social aspects (friendships, etc.). The students had had some previous experiences with PBL, but not with the *Lepida Scuola* approach.

It should be noticed that undertaking a PBL project in the last year of high school – with the "maturità" exam (a very tough final exam) at the end of the year – can be considered a very brave endeavour. In their final year, both students and teachers are focused on going through as much as possible of the official curriculum and getting ready for the exam. So this experience at BUS Pascal can be seen as evidence that the PBL approach has reached a maturity that allows schools to take it seriously and adopt it at any grade level.

The project work started on December 20th 2012 and ended on March 10th 2013. Students worked on it 3 out of 6 hours of class time every week, plus a few hours after school time. The 6 groups worked in parallel and have gone through some basic planning of activities and then their implementation. The initial ideation phase was skipped, partly because the targets and aims of the project were defined enough already to allow the groups to move on to the planning stage and partly to avoid the risk of reducing the early enthusiasm and engagement of the students. Since the two teachers often have a 'directive' style and prof. Zecchi was concerned that they may present the ideation task too much as a 'duty', he recommended to let the students "jump straight into the action". In any case, at the end of the project, the students will be requested to reflect back upon the aims and needs that they addressed (the focus of the ideation phase in PBL) and *forward* on "how would they do it now, if they had to do it again".

The second lab at Reggio Emilia Einaudi

Math teacher Roberto Menozzi has been working for many years with Prof. Enzo Zecchi on the development and application of LS.

There are 6 groups in the class with 3 to 5 participants each. The groups are self-organised, i.e., the number and mix of students in each group was autonomously decided by the participants themselves. This is the first time that the class has been doing PBL, group-based work in the Maths course. In the first year of high school (9th grade) the conditions are unfavourable for the application of the LS approach. In 10th grade, on the other hand, the official national requirement to certify students competences creates both the need and an opportunity to apply the LS approach, which was designed also to meet that requirement. In fact, the class we met is doing PBL work also in another course and Roberto acknowledged that the students are a bit stressed, because the LS approach and group work is quite demanding (students have to be active and creative all the time, to participate and discuss with their peers, etc.).

The assignment to the groups was to find a way, by creating a PowerPoint presentation, a video or some other artefact to explain to 'others' (specific target to be identified by each group) a Maths topic already taught by the teacher following a traditional (transmissive) approach. The proposed topic was "Special products of polynomials" broken down into sub-themes such as matrixes, linear equations, etc.

The project work started in December 2012 and ended in May 2013. The ideation phase (identification of end users, their needs and artefact's features to meet them) ended with the production of mind maps (using https://bubbl.us/) which have been assessed by using the corresponding rubric. In this phase, students have also spent some time looking on the web for inspiration and for any already existing material that might be reused. The feasibility-plan phase (definition of macro-activities with related resources, including learning needs, and timing) has also been completed and assessed by using the corresponding rubric. Evaluation in these first two steps has been at group level. Now the groups are in the implementation phase, and the attribution of individual tasks to each group member (done in the planning stage) will make it possible to perform also individual-level assessments. These will be done twice: for the production step and for the final presentation step.

Students defined by themselves the specific features of their product: use of colours, fonts, transition effects etc. for the PowerPoint slide presentations; screenplay and other aspects for the one group that decided to make a video (a female member of this group had an older brother that taught her some video making skills, so the group decided to go down this path. The other students were then actors).

The school has a computer classroom with mostly broken down equipment (money is lacking for maintenance and replacement) and there was no computer classroom's time allocated to Roberto's classes. The approach was therefore forcedly BYOD: Bring Your Own Device. Students brought their own equipment from home (but without internet connectivity) and for presentations they used the school auditorium's equipment or a portable beamer. In any case, Roberto declared not to believe in the computer classroom idea, as he would rather prefer to have ICT tools available in each classroom, to be freely used when needed.

Figure 1 – Students at work : brainstorming – ideation map

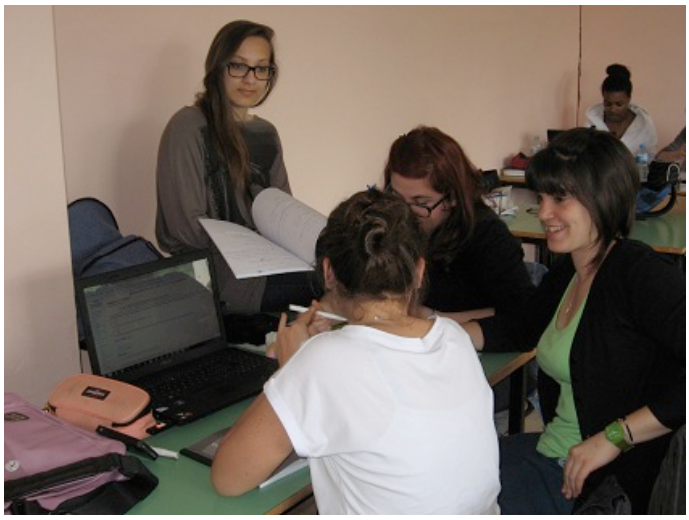

Figure 2 - A different classroom!

Young people's voices

For these Labs, were analyzed both the youth point of views collected in 2012 (before the beginning of the projects) and their opinion at the end of the labs, both through questionnaires and classroom discussions. Collected opinions come from both good students and bad students (in terms of results), technology lovers and not, enthusiast and unmotivated and so on. So, even if the sample involved is not very big, it is quite representative of typical 18-years-old Italian student.

Almost all students have a positive attitude towards technology and media: they see these tools fundamental for their future. They also like alternative activities and teaching method, like group work, laboratories, projects, confront with their peer, solve problems and so on. They think that they can benefit from such activities.

Students give a very positive evaluation of this experience: they learned both content and method, they had fun, and they are proud of what they did. Students indicate a high degree of satisfaction and motivation. The project is much preferred to the classical lessons. They improved also their competencies in the use of PowerPoint – a simple program, but nonetheless not properly mastered by students: "One of the problems that we found in the work was the use of the PowerPoint program because we had to discover many functions but with a little of patience we managed quite well".

Social competences development was also part of it: "It taught us to know better class people, to work in groups, confront and sometimes even discuss".

However, students identify three main problems: the difficulty of working at a distance, the lack of computers in the classrooms and the lack of time to complete the entire project. "The work was a bit difficult, because the time available was not much and, because of the tests in other disciplines, we were not able to meet on a regular basis."

Figure 3 - Students at work on their own devices

Figure 4 - Mastering PowerPoint

Mentors' voices

Mentors were very positive and motivated. Both those that already had worked with LS and Enzo Zecchi, and the new ones to this approach were in the end strongly convinced of the positive impact of the PBL approach: it is "valid, effective and functional" for learning.

The community voice

The community voice was collected through interviews with Marco Incerti Zambelli (Head of high school "Istituto Blaise Pascal") and Eros Guareschi (former ICT manager at the Municipality of Reggio Emilia), in July, 2013.

Mr. Zambelli claimed that the experience was absolutely positive and the labs proved that problem and project-based learning both can take place in school classrooms (which also corresponds to an initiative of the Italian government). And in order to this, some conditions must be met: keen teachers; proactive students; the right environment (school). Furthermore, Mr. Zambelli said that the project used, was really effective in teaching the 21st century skills and competences required for pupils. And this result did not affect formal (i.e. traditional) education. It means that if this approach is used properly, it can really make a difference for schools. Finally, he stated that this should be expanded and improved upon, but this requires support from the government, local administrations and school managers support… while he is sure that a lot of our teachers are looking forward to this change.

Mr. Guareschi basically agreed with Mr. Zambelli's statement about the necessity of the role of the local administration to provide technology for schools. However, he made 2 important assumptions. First of all, that technology should be used with a …… Second of all, that technology and media will invade schools, as they invaded our lives and we can do nothing about that (in this period a lot of teachers tried to leave technology out of school). Therefore, to export the Lab experience, the key thing is not the technologies – coming up anyway – but the LS/PBL approach.

Lessons learnt

The labs generated high motivation and engagement, and the work proceeded smoothly and with high energy. The labs' approach generated a new dialogic balance between students and teachers, and among peers. In terms of learning, the labs proved to be effective.

Students appreciated the LS PBL approach. The project is part of the normal school curriculum and the productions correspond to two or more assessments.

Most students know the different media and technological devices, but they do not know how to learn with them. These labs and the approach can improve new skills in media education. The use of technology and their learning becomes automatic and not an end in itself, but calibrated and functional to the development of the project and to the productions of cognitive artefacts.

Finally, this lab experience, based on a solid approach with a significant previous experience, clearly indicates that the key thing is not the technology, but them method that makes it a useful learning tool, and easily integrated in the school practice.

PART II

Lab overview

The following table presents a summary of the overall labs experience in Reggio Emilia.

WHO?	**Reggio BUS Pascal**	**Reggio Einaudi 1 / class 2D**	**Reggio Einaudi 2 / class 4A**
Number of mentors/teachers	2	1	1
Number of media experts	4	4	5
Number of learners at the beginning	20	27	21
Number of learners that completed the lab	20	27	21
Age of learners	18-19	15/16	17/18
% of drop-out/unemployed learners	0%	0%	0%
% of migration background learners	10%	37%	14%
Organized in collaboration with	BUS Pascal (high school)	Ist. Tecnico Einaudi Correggio RE	Ist. Tecnico Einaudi Correggio RE
WHAT?			
Was the work organized in groups?	Yes	Yes	Yes
Size of the groups (if any)	4	3/4/5	3/4/5
Central topic (if any)	Electronics & English	Math	Math (analysis)
Lab products	Cognitive artefacts (presentations, videos, etc.)	Cognitive artifacts (Presentations and Video)	Cognitive artifacts (Presentations and Video Kahn Academy like)
Media devices used (e.g., Camera)	Camera, video projector, smartphone	Camera, Smartphone with whatsapp, Video projector	Tablet with Doceri, Camera, Smartphone with whatsapp, Video projector
Software applications used	Tina-Ti, LT-Spice IV, Qucs, OrCad, MicroCap 10, Real Player flash video recorder/player, Circuit Simulator1.5, PowerPoint, MovieMaker,	Power Point, Movie Maker, VLC, Bubble, Word, Moodle, Google drive	Power Point, Bubble, Word, Moodle, Google drive, Doceri, Cabri

Prezi, HTML

WHEN?			
Lab started on (month, year)	December 2012	March 2013	April 2013
Lab ended on (month, year)	March 2013	May 2013	June 2013
Meeting schedule	3h/week at school + 2h/week at home	1h/week at school + 3h/week at home	1h/week at school + 4h/week at home
Total number of lab hours	about 40	about 50 h	about 50 h

WHERE?			
Location	At school	At school, and mainly at home	At school and mainly at home
Number of rooms available	1 classroom	at school, 1 classroom	At school, 1 classroom
Computers available	>20	6 Personal Notebooks + Personal smartphones	1 Personal Tablet, 5 Personal Notebooks, Personal Smartphones, mobile router wifi 3**G**

WHY?			
Was the lab part of a formal curriculum?	Yes	yes	yes
Was formal evaluation foreseen?	Yes, through a rubric	Yes, through three rubrics	Yes, through three rubrics
Were credit awarded?	Yes	yes	yes

Additional links

http://moodlex.greenteam.it/

http://rmenozzi.wordpress.com/

Sources

This report was developed based on the following sources of information:

1. Data provided by the organizers about the labs.
2. The planning documents and end products of labs experiences
3. Transcripts of group interviews: young people voice and two transcription for the community voices
4. Pictures and video by the organizers about the labs