



Envisioning DIY learning in primary and secondary schools

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Abstract

The DIYLab project (Do it yourself in Education: expanding digital competence to foster student agency and collaborative learning. European Commission)ⁱ seeks to explore the changes (and its educational effects) occurring in the last decade regarding digital competencies, especially in relation to the emergence of a culture of collaboration, that connects youth learning, technology and DIY (Kafai & Peppler, 2011). To achieve the project's objective, we are following a methodology based on the principles of collaborative action research (CAR). This paper focuses on the first step of the CAR process and shows the main challenges identified by teachers, students and parents in order to implement the project's learning philosophy in the current curricula and schools organisation. We carried out a series of focus groups with teachers, students and parents from primary and secondary schools and the university to discuss what DIY learning looks like in the participants' educational contexts. Based on these discussions we have begun to analyse how each context imagines DIY learning and how it relates to the notion of virtual space. This paper focuses in the Spanish primary and secondary school participating in the project.

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DIYLab

In January 2014, we began a 3-year project titled *Do-it-Yourself in Education: Expanding Digital Competence to Foster Student Agency and Collaborative Learning*.¹ This Comenius grant stems from the acknowledgement that over the last decade young people's relationship with digital competencies has evolved drastically. In the last years, our understanding of digital competences has significantly change. First, it considered young people's critical understanding of new digital media as a key aspect of digital literacy (Buckingham, 2003; Gilster, 1997). And in a second phase young people were not only envisioned as consumers who browse the Internet and share information on social networking sites, but also as producers of content, who contribute to blogs, design animations, graphics, and video productions (Ito, Baumer, Bittanti, boyd, et al. 2009). This has generated alternative approaches to digital competence, such as the proposal of Jenkins, Purushotma, Weigel, Clinton, et al (2009, xiii) to "shift the focus ... from questions of technological access to those of opportunities for participation and the development of cultural competencies and social skills needed for full involvement."

This project seeks to explore the changes (and their educational effects) which have taken place in the last decade regarding digital competencies, especially in relation to the emergence of a culture of collaboration, that connects young people's learning, technology and DIY philosophy (Kafai & Peppler, 2011). Young people's efforts to create and disseminate digital media have been associated with the growing of the do-it-yourself (DIY) movement (Spencer, 2005). Starting in the '90s (Halfacree, 2004) with arts, crafts, and new technologies (Eisenberg & Buechley, 2008; Lankshear & Knobel, 2010), it is now prevalent in curriculum contents (Guzzetti, Elliott, & Welsch, 2010), giving educators and students the opportunity to create, share and learn in collaboration.

To achieve the project's objectives, the consortium membersⁱⁱ have followed a methodology based on the principles of collaborative action research (CAR): "A participatory, democratic process, concerned with developing practical knowing in the pursuit of worthwhile human purposes, grounded in a participatory worldview which we believe is emerging at this historical moment. It seeks to bring together action and reflection, theory and practice, in participation with others, in the pursuit of practical solutions to issues of pressing concern to people, and more generally the flourishing of the individual persons and their communities" (Reason & Bradbury, 2001, 1). Building on this foundation, in the different phases of the project, we will use complementary methods to collect data (Green, Camill & Elmore, 2006), with the purpose of fostering the process of reflection-action-reflection, while developing a culture of collaboration, discussion and purposeful inquiry.

An interpretative ethnographic approach

One of the more concrete outcomes of this project will be the production of open-source learning materials, developed by students and teachers in the participating institutions. These resources will serve as tools for other learners, linking the work carried out in the project to other schools, universities and broader DIY communities. What form these materials will take, how they will circulate, and what type of audience they will generate are questions that we will address along in the project. Currently we are in the initial stages of the

project and have yet to negotiate the specifics of the implementation phase in each school and university. At this time, we focused on thinking about how school parents, teachers and students conceptualize the notion of DIY learning, garnering information that will be useful when designing the DIYP Lab in each context.

Included in the scope of this project is our interest in studying what happens when schools opt to actively supporting DIY learning practices. Within this framework of research, our ethnographic approach will not be exclusively concerned with researching “online communities and interactions”. Instead, we will develop an interpretative ethnographic inquiry (Denzin, 1997) around the observation and study of the interactions between the Internet-based DIY activities and the school environment (Orgad, 2009). In this sense, to borrow from Hine’s (2000) categorization, we consider online environments as culture (rather than cultural artefacts) and are attentive to the potential culture shock that may result from the implementation of this project.

In order to promote the sustainability of the project within the participating institutions, and perhaps beyond, it is important to understand how DIY may be successfully incorporated into the school culture and what tensions it may provoke. This means we cannot only research how students and teachers engage with DIY but also, how those experiences affect local understandings of learning, student agency, the role of teachers, and the place for digital tools and online platforms within the school curriculum.

Focus groups with schoolteachers, students and parents on the topic of DIY learning

The first step in this research project was to set up a series of focus groups. Each participating school (three primary, three secondary) organized three focus groups –two at higher education level, comprising of six teachers, students and parents, respectively (Table 1). University researchers and the school coordinators led the discussions in an effort to gain an initial understanding of what DIY practices were already taking place in the school environment and what resources the school has to support them. In addition to using this information to inform the design of the DIYP Labs, it is also a rich source of data for considering the points of contact between formal learning and DIY experiences, and also for beginning to map out how DIY could have a disturbing effect on existing notions of schooling in each context.

Primary school	6 students who are, or are about to become 5th- year students
	5 5 th -year teachers
	6 parents of 5 th -year students
Secondary school	6 students who are, or are about to become 3 rd -year school students
	6 teachers of 3 rd -year secondary school students
	6 parents of 3 rd -year secondary school students

Table 1. Focus groups

We shared a document with the participants explaining the basic principles of DIY philosophy to encourage reflection and to explore their familiarity with the notion of DIY. The first proposed questions to discuss were:

Students

- Up until now, when do you think the teachers at your school have introduced learning experiences related to DIY? What did they propose you to do and what tools did you use in the process?
- Where else do you develop these types of learning practices?
- How? With what tools? With whom?

Teachers

- Up until now when do you think you or other teachers at your school have introduced learning experiences related to DIY? What did you/they do and what tools did you/they use?
- Where do you think the students develop this kind of learning practices the most? What do they do? With whom do they work?
- Do you think that the school could improve its offer of these types of learning experiences? How?

Families

- Up until now when do you think the school has introduced learning experiences related to DIY to the students? What did they do and what tools did they use?
- In what other types of situations do your children participate in DIY learning experiences? What do they do? With whom do they collaborate? What tools do they use?

The contents of the discussion groups were transcribed and analysed using a series of categories, in line with those used for the analysis of official curriculums and the school programmes:

1. Knowledge and evaluation of the notion of DIY.
2. Autonomous and self-regulating learning.
3. Interdisciplinary knowledge.
4. Digital competence.
5. Collaborative and problem-based learning.
6. How to frame the project considering the formal aspects of the curriculum.
7. Emerging elements befitting each situation.

In the following paragraphs, we first characterise the Spanish primary and secondary school. Then, based on the content of the discussions taken place in the focus groups, we share a preliminary analysis of how the Spanish school communities participating in the project envisage DIY learning and what notions of the virtual are present in this imaginary. More specifically, we will refer to DIY learning in and outside school and the notion of the virtual.

School features

Escola Virolai of Barcelona is located in the district of Horta- Guinardó. It caters for Primary and Secondary students. In the 2010-2011 academic year, the school had over 900 students. Escola Virolai is a charter school, a semi-public institution that receives both public and private funding. The socioeconomic context of the school is of mainly average middle-class families, who are very committed to their children's education.

The core educational principles from the school's mission statement are:

1. Family/school collaboration.
2. The education and personal development of the students.
3. The relationships in the school community are based on affection, respect and trust.
4. Striving to provide the best possible learning opportunities to enable every child to maximize their abilities.

5. Helping students become good citizens with reasoning skills, creativity and critical capacity, who are able to commit to building a better society.

Escola Virolai firmly believes that educational innovation is the only way to attend to the changing needs of students and the society, and has been on the cutting-edge of integrating ICT in the classroom. The school is implementing the *TAC Pla* (Learning and Knowledge Technology-LKT Plan) based on different official initiatives such as Educat 2.0 project (prior to Educat 1x1). The main aim of this plan is to progressively defining a global and fundamental methodological change that incorporates methodologies that ensure the central role of students in the construction of their learning, the creation of collaborative learning environments and the role of the teacher as learning facilitator.

The *TAC Pla* seeks to:

- Define the uses of different communication, management and teaching environments: Web, Clickedu, Virtual Classroom, Virtual Corner and other educational platforms to take advantage of all possible resources to enhance communication, collaboration and consistency among all levels of the educational community.
- Review the sequencing of digital competence, incorporating it transversely into course schedules, defining the assessment strategies used to ensure consistency in both course, class years, and whole school levels.
- Prioritize the use of LKT Technology as a tool to improve individual attention to all students and increase their role in learning.

The school has a good and updated computing infrastructure with internet connection in all school spaces. It is using a good range of digital tools. In addition, it has an in-service professional development plan especially focused on the improvement of teachers' digital skills.

DIY learning in and outside school

1. *The concept of DIY is not widely known, but participatory activities are typical both in and outside school*

The teachers demonstrated a passing familiarity with the term "DIY" but did not feel identify with the movement. In the case of the teachers, it was something they had heard of, or read about it, but it does not come from their practice and specific experiences. However, because of a well-defined school mission statement, the teachers had a clear idea about the importance of student autonomy and placed this characteristic at the centre of the school project. In fact, they mentioned activities linked to solidarity actions encouraged by the school. The DIY philosophy connects with one of the fundamental aspects of the educational project that involves the pupils' participation in the school.

Secondary school students had some experience with DIY tutorials on the Internet, claiming that DIY allowed one to make things one would not have otherwise have been able to make, or claiming that DIY was about doing things without help from others. They summarised it as "doing something yourself". They related it to the possibility of doing things they like by themselves and

finding tutorials for doing what they want. They have read about this question and have found out on Internet and some have explained it to others. The primary school pupils know the term and recognise it from other activities they have done, and they understand it as “learning something on your own”, and in some cases refer to tutorials, Internet, videos, YouTube, mathematics or reading web pages.

Parents claimed to never have heard the term, but were able to describe in great detail activities their children engaged in that went beyond the traditional school curriculum, where their level of interest lead them to do more, both on their own and at school. Secondary school families stated they did not know what DIY was and have never heard about this movement or the philosophy associated with it. Throughout the session, however, reference was made to a series of projects that are undertaken in the school and which could be linked to this movement. The primary school families introduced the question of the cultural difference; they thought that there are contexts more directed towards this philosophy than others are. This reflection recalls the need to not forget that ‘the school does not educate alone’ and that the cultural and social context has an important influence that is transmitted through the educational guidelines of the families, the media and the value they all give, not only to know *what*, but to know *how*, *where*, for *what* and *why*.

For all them, putting the DIY philosophy into practice involves a series of predispositions and challenges. The primary school teachers are clear about the importance of accompaniment, of mediation in the learning process. The secondary school ones raised doubts and were ambivalent about the degree of autonomy pupils should have to develop in the project.

2. DIY activities

In table 2 we have compile a list of activities that teachers, parents and students identified as containing elements of DIY learning.

In school	Outside school
<p>Computer classes, where the students are creating apps. After completing 5 assignments, they can design their own app.</p> <p>“Synthesis credit” project: “We have to work on a specific theme, but aside from that we can do what we want.”</p> <p>The “Entrepreneurship project”: in the class Educating Citizens, the project allows students to design their own businesses-</p> <p>Lego League: an extracurricular project that is “really fun!” According to a parent’s comments, “the participation is horizontal and the kids teach each other.”</p> <p>Open school day. The event when the school is open to the perspective and current students’ families. Students collaborate by organizing the activities and exhibitions.</p> <p>Extracurricular activities offered</p>	<p>TV: teaches “basic life skills.”</p> <p>School exchanges</p> <p>Video tutorials. “YouTube teaches you a lot”. “You can always find a tutorial there if you need it.”</p> <p>Yahoo Answers</p> <p>Books. “You can learn as much from books as you do from clicking around on ClickEdu (a language platform).”</p> <p>Music. “Many kids in English classes aren’t interested and they don’t learn... but as soon as a song becomes popular they just listen to the lyrics and understand-it!</p> <p>Scripts: an online messaging game</p> <p><i>El rincón del vago</i> (in English: The slacker’s corner): A website “where people upload their schoolwork, and it’s there, you share it.”</p>

during school hours, such as the “Midday workshop” or “Public speaking workshop”. Students volunteer to participating and learn different skills or do community service activities.	
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Table 2. DIY learning activities.

3. DIY introduces tensions within traditional understandings of education

From the content analysis of the various focus groups emerged a series of tensions that we synthesize as follows.

- *Does DIY replace the teacher?*

There was a growing anxiety among teachers regarding their hypothetical role in a “do-it-yourself” classroom environment. One of them asked: “when the kids design their own learning, autonomously, using new technology, what is the teacher’s role? What will it be like?” Students and teachers described many instances where the young people were encouraged to act autonomously. Therefore, it could appear that the phrase *do-it-yourself* limits the way teachers can imagine their contribution to the process.

- *To what extent do students want to assume more responsibility?*

Secondary school students’ value having a say in what they study, but DIY learning also poses a good deal of doubts and ambivalence for them.

“Internet is a space where you can get information about DIY... but it also allows you to copy, slack off, and get distracted!”

“When you have more freedom at school some people just say, “OK. I’m going home!”

Apparently the role of responsibility inherent in DIY is an unsettling notion for the young people in question.

- *What happens to assessment?*

Parents, students and teachers expressed doubts regarding the assessment of DIY learning practices. There is already an acknowledgement that assessment is problematic and that removing any form of standardization in the learning process result into an even less transparent process.

Notions of the virtual

When discussing the possibilities and potential setbacks of DIY learning, the conversation began to introduce different understandings of how the virtual environment interacts with education today.

1. The idea that children are ‘digital natives’ is still a pervasive discourse

Parents remark on the facility with which young people use technology to create interactive content and compare that with what they did as young people. They considered this fact as both positive, in the sense that young people are seen as possessing the skills to succeed, but also as negative, as there is an acknowledgement that this comes at the expense of other skills, knowledge, attitudes, etc.

“Using new technology, they can do it all (websites, groups...). It’s as if they’ve forgotten their hands, or their imagination, at least the way we understood them.”

The consensus appeared to be that today new skills, digital skills, are not necessarily seen as being worse, but they are understood as being essentially different from analogical skill sets. During the project questioning this perceived difference may be a productive exercise for thinking about creative learning or autonomous learning as not necessarily dependent on the use of digital technology.

2. *The Internet is an archive of open resources, available for personal use*

There is a tension that arises when discussing open-source materials, because they are seen as both a fund of knowledge and a potential shortcut, allowing you to get a result without doing the work.

The idea of autonomous learning was familiar to all focus group participants and it appears that it is well managed and has become an integral part of the activities carried out at the primary and secondary school participating in the project. However, when discussing “DIY learning” it emerged that it is not considered exactly the same thing. DIY implies more freedom and choice, and less structure.

We noted during the focus group discussions that there was little mention of the collaborative dimension. The “giving back to the community” type of ethos that is prominent in the DIY movement received very little attention. Differentiating between the idea of having total autonomy in one’s learning and the concept of becoming an active and equal citizen within a learning community may be a productive starting point when designing DIYLabs.

3. *Connectivity is a way of living and learning*

Parents’ remark on the high level of connectivity they observe among their children, commenting that: “They have learned to be permanently connected to a virtual world, which we didn’t have when we were students. This gives them a great window for sharing their feelings, experiences, opinions... Lots of things... they spend all day sharing.”

Primary school teachers describe how their students are accustomed to working in groups. Illustrative of what is referred to as life-wide learning (Banks, Au, Ball, Bell, et al., 2007) they mention that their students learn from the teachers, their peers and their families. The parents went on to corroborate this sentiment.

While the notion of community was notably absent when discussing the potentials and perils of bringing more DIY practices into the schools, it did appear here, in discussions that refer to the way young people use technology to stay communicate and express themselves. Parents paint a picture of young people constantly sharing and learning with others.

4. *Virtual space, in educational terms, provides a space of infinite differentiation*

Relying more on the Internet and student interests forces the school community to re-think the importance of core curriculum content.

The focus groups discussed whether young people should be learning the same things, and if so, in the same way, and if not, how to assess learning. Some students and parents discussed learning practices that appear to be increasingly widespread and have little to do with traditional teaching (Collins & Halverson, 2009; Thomas & Seely Brown, 2011).

In the parents' words:

"They have a different approach to create and are able to create interactive content on their own world. They do it by using new technology (websites, groups, etc.)."

"You could say that technology dismantles time ... they have learned to live with them and achieve their goals."

"They create your own learning and sharing communities. The WhatsApp, for example, has been a brutal change. They solve many questions (educational and not educational) [...] I think it can contribute much, much, much to education."

The focus groups talk about what it means to have a "solid knowledge foundation" representing two schools of thought. On one hand, it is the idea of a predetermined set of facts about the world and standards for resolving problems, organized on a scale of more simple to more complex (Sawyer, 2008). On the other hand, an idea emerges that involves a set of knowledge and skills developed by not only focusing on the *what*, but also on *how*, *why* and *for whom*.

Conclusions

In this early stage of the project, we are interested in learning about how a transversal project like DIYLab can be integrated into the primary and secondary schools and higher education. We want also explore how educational communities that value autonomous learning – such as the institutions that agreed to participate in this project – conceptualize and work with DIY practices.

On the one hand, there is a sense that DIY is somehow already happening and that it is a part of young people's lives. We have noted that young people are highly connected and literate in their use of digital technology and that they value and seek out learning opportunities, both in and out of school, that provide engaging avenues for learning, playing and socializing.

On the other hand, in the case of the participating Spanish school, we discovered that although they offer a lot of support for autonomous learning and the transversal development of digital competences, the notion of DIY implied something beyond what the school community was already doing. The concept of DIY troubles basic understandings of schooling, such as the core curriculum, the role of teachers and students, and assessment frameworks. Questions abound when deliberating how, or to what extent DIY deserves a place in educational systems.

In general, we found that practically all the participants in the focus groups had some idea about the notion and educational implications of the DIY philosophy. However, the point of view of each group differs. Our implicit observation and interpretation was that, all three-target groups contributed their own perspective to the discussions:

Teachers' knowledge of the DIY philosophy comes from documental sources, but the term did not typically appeared in participant's specific experiences and practices. They rather mentioned extra-curriculum activities linked to solidarity actions and expressed confidence in students' abilities.

Primary and secondary school pupils summarised DIY as “doing something yourself”. They related it to the possibility of doing things they like by themselves, such as finding tutorials online to learn to do what they want, and in some cases refer to tutorials, Internet, videos, YouTube, mathematics or reading web pages.

Secondary school students were a little sceptical when evaluating to what extent the school can promote genuine autonomous and self-regulated learning processes in accordance with the DIY philosophy. In their own words: “It cannot be done in a normal school like this one... in other words, it cannot be done through an educational system if what you want is to impose contents on the course”. “It might be possible but not in a school setting in which the contents are set by a ministry and not by a spontaneous order”. They also pointed out the importance of the pupils’ predisposition to learn.

For parents, while the term DIY was unfamiliar to most, they were able to reference a series of projects that are undertaken in the schools which they associated with DIY which they linked to this movement, as well as list different extracurricular activities their children engage in. Parents also had a wider view of students’ lives, incorporating activities both in and outside school, and easily drew connections between the two, stressing how the development of digital competence went beyond school walls.

From an analysis focus group content, it is clear that the virtual world is considered a vast resource. This presents both an opportunity—information is more accessible and learning opportunities multiply—and risk—the lack of regulation, standards and structure is unsettling. Regarding our project, a productive way to move forward is to think about the collaborative ethos implicit within the DIY movement. By moving away from a discourse that defines online materials as resources, towards thinking about how to participate in, and benefit from, collaborative learning environments, we hope to foster a more sustainable and far-reaching integration of the DIYLab project into schools.

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