

6

TRANSFORMING THE TEACHING AND LEARNING CULTURE IN HIGHER EDUCATION FROM A DIY PERSPECTIVE

(TRANSFORMAR LA CULTURA DE ENSEÑANZA Y APRENDIZAJE EN LA EDUCACIÓN SUPERIOR DESDE UNA PERSPECTIVA DIY)

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ABSTRACT

This article focuses in part of the results of the implementation of the European project DIYLab in five bachelor's degrees at the University of Barcelona (Primary Education, Early Childhood Education, Social Education, Education and Fine Art). The project was carried out in six elementary and secondary schools and two Universities of Spain, Finland and the Czech Republic. The main focus was to incorporate learning modalities related to the Do it Yourself (DIY) culture, fostering creativity, collaboration, self-regulation, authorship and a critical use of digital technology. Following a methodology based on the principles of participatory action-research (PAR), we first organized discussion groups with teachers, students and, in the case of elementary and secondary schools, families. Then, we defined the implementation, based on the characteristics of each institution and the formative actions organized with the teachers. During the teacher's

professional development, the participants proposed that students create audio-visual productions collaboratively about their learning and the processes that propitiated it. Simultaneously, we created the open digital platform DIYLabHub with the aim of sharing the productions created by students. During the implementation at the University of Barcelona, 471 students collaboratively created and shared 76 audio-visual objects in the Hub and the researchers carried out observations, recordings, field notes and discussion groups. In this article, we present the results of the analysis and the conclusions of how teaching and learning practices were transformed, how teachers' and students' attitudes and roles were reconfigured, and the possibilities of sustainability of the DIY culture in Higher Education.

KEYWORDS

Higher education; learning; participatory action-research; students; teachers; audio-visual production.

RESUMEN

Este artículo se basa en el proyecto europeo DIYLab y da cuenta de parte de los resultados de su implementación en cinco grados de la Universidad de Barcelona (Educación Primaria, Educación Infantil, Educación Social, Pedagogía y Bellas Artes). El proyecto se desarrolló en centros de educación primaria, secundaria y superior de España, Finlandia y la Chequia. Su foco era incorporar en las instituciones implicadas, modalidades de aprender relacionadas con la cultura Do it Yourself (DIY), fomentando la creatividad, la colaboración, la autorregulación, la autoría, la compartición y el uso crítico de tecnologías digitales. Siguiendo una metodología basada en la investigación-acción participativa (IAP), organizamos grupos de discusión con profesorado, alumnado y familias y definimos la implementación a partir de las características de cada contexto y de acciones formativas con el profesorado. Durante la formación, se propuso que los estudiantes realizaran de forma colaborativa producciones audiovisuales sobre sus aprendizajes y los procesos que los habían propiciado. Simultáneamente, creamos la plataforma digital abierta DIYLabHub, con el objetivo de compartir las producciones creadas por los estudiantes. Durante la implementación en la Universidad de Barcelona, 471 estudiantes crearon colaborativamente y compartieron en el Hub 76 producciones audiovisuales, y los investigadores realizamos observaciones, grabaciones, notas de campo y grupos de discusión. En este artículo, presentamos los resultados del análisis y las conclusiones sobre cómo se transformaron las prácticas de enseñanza y de aprendizaje y se resignificaron las actitudes y los roles del profesorado y alumnado, y sobre la sostenibilidad de la cultura DIY en educación superior.

PALABRAS CLAVE

Educación superior; aprendizaje; investigación-acción participativa; estudiantes; profesorado; producciones audiovisuales.

INTRODUCTION

Currently, educational institutions find themselves immersed in a network society (Castells, 2000). Digital media and Internet use has permeated the lives of children, youth and adults, introducing substantial changes in how they learn, communicate and interact with information (Jenkins, Ito & Boyd, 2015). According to Twenge (2017) digital technology is not the only thing that makes current young people distinct from every generation before them; they are also different in how they spend their time, how they behave, and in their attitudes toward religion, sexuality, and politics. They socialize in completely new ways, reject once sacred social taboos, and want different things from their lives and careers. Therefore, the dynamics of learning, socialization and access to information have dramatically changed. In this context, we highlight the practices that foster «social networks and content creation» (Richard & Kafai, 2016, p. 1478) and collaborative learning practices when faced with challenges or projects. In all of these practices, «a culture of participation exists» (Jenkins, Purushotma, Weigel, Clinton, & Robison, 2009, p.3). In this way, especially outside educational institutions, practices arise that configure different meaning for education and socialization and other ways of learning.

This reality generates new questions and challenges for educators, families and educational policy makers. A number of authors have begun to recognize and consider how and where children and young people learn (Bell, Tzou, Bricker, & Baines, 2013; Buckingham, 2007; Carey, 2014; Erstad, Gile, Sefton-Green, & Arnseth, 2016), in order to explore their learning cultures (Erstad et al., 2016; Domingo-Coscollola, Sánchez-Valero, & Sancho-Gil, 2014; Fullan, 2002; Hernández-Hernández, 2017; Livingstone & Sefton-Green, 2016; Thomas & Brown, 2011). In line with this approach, we wish to move forward with the need to explore learning cultures in educational institutions that allow ways of learning to be contextualized and expanded, thereby broadening organizational approaches and teaching and learning practice.

In this context, the European project on which this article is based, *DIYLab - Do it yourself in Education: expanding digital competence to foster Student agency and collaborative learning*, was carried out between 2014 and 2016. It was implemented in primary and secondary schools and higher education institutions in Spain, Finland and the Czech Republic. It is an initiative that is connected to the arguments laid out above, as well as a number of studies about the realities and challenges of young people's learning in the digital age (Ashworth, 2016; Boyd, 2014; Carey, 2014; Knobel & García-Valcárcel & Tejedor-Tejedor; 2017; Knobel & Lankshear, 2010; Palaigeorgiou And Grammatikopoulou, 2016; Perez-Escoda, Castro-

Zubizarreta, & Fandos, 2016; Sharpe, Beethan, & De Freitas, 2010; Shirky, 2010). In this article, in addition to an overall vision of the European DIYLab project, we recount the implementation of this project in five degrees of the University of Barcelona (UB): Primary Education, Early Childhood Education, Social Education, Education and Fine Art.

The focus of the DIYLab project was to incorporate learning methods related to do-it-yourself (DIY) culture in the institutions involved. By way of example, we point out that in DIY networks, young people voluntarily dedicate time to intensive learning and tackling tasks of a high technical level (Kafai & Peppler, 2011, p. 89). Starting from this focus, our challenge was to introduce (in each institution involved) teaching and learning practices arising in informal contexts. How, therefore, to contextualize learning by generating new questions and approaches in the practice of the organizations involved.

The main purpose of the DIYLab project was to promote lifelong and life-wide learning (Banks et al., 2007) through the development of critical digital competence (Ala-Mutka, 2009; Gutiérrez & Tyner, 2013), agency and creativity. In addition, we aimed to stimulate the commitment of students by proposing meaningful, collaborative learning experiences that could be sustained and extended beyond the project completion. To achieve this, we set out the following objectives:

- Analyse how the DIYLab project can be integrated into syllabuses and linked to learning outcomes.
- Formulate a conceptual approach, through a collaborative professional development process (between researchers and teaching staff), to allow students to produce and share knowledge, while self-regulating their learning by fostering agency, digital competence and creativity.
- Establish flexible spaces (called DIYLabs) for developing cross-curriculum projects where participants introduce, develop and use inquiry-based projects connecting different class subjects and students' interests.
- Develop the open and cross-cultural DIYLabHub digital platform (<http://hub.diylib.eu>) in order to share the audio-visual productions created collaboratively by students about their learning and the processes that gave rise to this.
- Through a participatory action research process, assess the design and implementation of DIYLabs —with researchers, teachers, administrators and students— in order to make sustainable improvements in each institutional context.

Based on these objectives, we proposed a process of rethinking students' learning, placing stress on the realization of transformations and improvements in the educational practice of the participating institutions. This initiative is in line with the Organisation for Economic Co-operation and Development (OECD) recommendations (2010, p. 5) as we aim to promote «bottom-up initiatives ... setting them in a propitious learning and teaching environment ... and stimulating reflection on the role of teaching in the learning process all contribute to quality teaching».

This article presents the analysis of the implementation of the DIYLab project at the University of Barcelona. The main question we explore is how the learning and teaching culture is affected when we integrate practices related to the DIY perspective, such as fostering creativity, collaboration, self-regulation, authorship and a critical use of digital technology. In the results, we address how teaching and learning were transformed, how teachers' and students' attitudes and roles were reconfigured, and the possibilities of sustainability of the DIY culture in Higher Education.

METHOD

The DIYLab project started with institutions from three countries preparing the proposal and presenting it to the European Commission. The following were the participating institutions in Spain: the Virolai School (a primary and secondary school in Barcelona) and the University of Barcelona. In Finland: The Teacher Training School (a primary and secondary school in Finland) of Oulu University. In Czech Republic: ZŠ Korunovační (a primary and secondary school in Prague) and Charles University. The project approach and its technical reports are available at <http://diylab.eu/>. As a European project, it was subject to external quality assurance monitoring throughout the whole process and the written consent of all those involved in the project. We highlight the fact that a total of 64 teachers and 1,191 students participated in its implementation, placing their 217 collaboratively-created audio-visual productions in the DIYLabHub.

With the aim of transforming teaching and learning practices and to consolidate these changes upon completion of the project, we followed a methodology based on the principles of participatory action research (PAR), understood as:

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 individual persons and their communities (Reason & Bradbury, 2001, p. 1).

The methods used throughout the project were: critical analysis of documents (Bowen, 2009), discussion groups (Barbour & Kitzinger, 1999), research-based practice (Furlong & Oancea, 2008) and observation, field notes and visual documentation (Dussel & Gutiérrez, 2006; Van Maanen, 2011). Discussion groups were carried out at the beginning and end of the project, involving teachers, students and, in the case of primary and secondary education, families. In total, 81 teachers, 57 family members and 163 students participated in the discussion groups, as laid out in detail in the technical reports. Next, we specify the significant content of the PAR phases carried out.

Project development: PAR Phases

During 2014 (phase 1), the specifications and implementation of the project were prepared based on the characteristics of each participating institution and the professional development of the teachers involved was undertaken. We highlight the most significant actions:

- The official curricula and syllabuses of the institutions involved were analysed, taking the dimensions of DIY culture into account. This allowed the identification (in each of them) of the most convenient curricular areas, spaces and moments to introduce learning experiences linked to DIY culture.
- The opinions and positioning of the students, the teaching staff and in the case of schools, the families, regarding the possible implementation of the project were explored through discussion groups. The content of these initial discussion groups was analysed based on different student's learning indicators.
- A professional development action was carried out for all those involved in the project. During this process, possible scenarios and proposals to implement DIY culture in each institution were thought up, defined and designed. In all cases, it was decided to opt for the prospects of research and problem-based projects.
- Guiding questions were raised to orientate students' collaborative audio-visual productions on their learning and the processes that gave rise to it: What have we done? How have we done it? What have we learned? How have we learned it? At the same time, the challenge of promoting six characteristics of DIY culture in teaching

and learning processes was put forward. These characteristics being: creativity, collaboration, self-regulation, authorship, sharing and the use of technologies.

During 2015 (phase 2), DIYLabs were implemented in the institutions involved (according to their characteristics), while taking into consideration the following basic, common points:

- Consideration of varying the role of students towards prosumers and authors of knowledge, and the role of teachers towards promoters of the students' learning processes.
- Collaboration as key to the pedagogical relationship, and the use of technologies as mediators of learning and ways of representing it.
- The collaborative making of audio-visual productions about the students' learning and the processes favouring it.
- Self-regulation related to the ability of those involved to manage their own learning, raise awareness and boost their self-confidence.

During 2016 (phase 3), the analysis of the implementation of the project was undertaken. To this end, two main actions are performed: 1) analysing the processes and results of the teaching and learning experiences carried out, and 2) organizing discussion groups to gather experiences and evaluations. The analysis focused on three dimensions:

- Learning: differences with other types of activities where the DIY perspective was not considered, project evaluation, reflections and suggestions.
- Attitudes and roles: how learning was carried out, changes with respect to other types of activities where the DIY perspective was absent.
- Project sustainability: continuity and evaluations (strengths, weaknesses, opportunities, threats).

Specifications of the development of the project at the UB

The main aim of implementing the project at the UB was to expand the digital competence, agency and creativity of higher education students by promoting meaningful, collaborative learning experiences based on DIY culture. To achieve this, the three phases of PAR were carried out (from 2014 to 2016) and we set out five significant moments:

1. Building the proposal based on the experience and knowledge of the participants through two discussion groups: one of 5 students

and the other of 5 teachers. In both groups, each member came from a different degree.

2. Analysing the curriculum and syllabuses of five degrees to decide where to implement the project and with which teaching staff.
3. Designing and carrying out collaborative professional development (with the teachers involved in the project) aimed at rethinking practices and notions of teaching and learning.
4. Implementing the project in the selected courses or subjects based on the professional development carried out and with the challenge of promoting six characteristics of DIY culture in the teaching and learning processes.
5. Analysing the processes and results of the teaching and learning experiences carried out. In addition, organize two discussion groups to evaluate the impact of the project, in which 9 students and 5 teachers from the different degrees participated. This article gives an account of these actions.

The project implementation process took place in 10 subjects from 5 degrees of Education and Fine Art Faculties of the University of Barcelona, involving 20 teachers and 471 students (see table 1).

The 20 involved teaching staff carried out activities related to the DIY perspective in the subjects they taught, according to their contexts and syllabuses. In general, they focused their attention and reflection on aspects related to teaching and learning processes, reviewing their teaching role, developing research and problem-based projects with students and stressing the importance of sharing the knowledge acquired with people from all countries through a digital platform (DIYLabHub).

In the degree in Social Education, the teaching staff from three subjects interconnected the learning experiences of the three groups of students. In this way, the students who carried out their internship in the third year recounted their experiences, which were scripted and produced by the first-year group and analysed by the fourth-year students. In the Education and Early Childhood and Primary Education degrees, students produced audiovisual accounts through which they narrated their learning trajectories over the length of the subject, in order to share what they had learned with others interested in the same areas. Through their accounts, they also related their lifelong learning experiences to the knowledge built up in the subject.

Table 1
Specifications of the sample of the University of Barcelona

Degree	Year	Subject	Teachers	Students	Audio-visual productions
Education	1st	Communication in Education	1	30	2
	2nd	Digital and Visual Culture in Socio-educational Processes	4	59	20
	2nd	Teaching and Learning in the Digital Society	2	74	7
	4th	Learning Environments, Processes and Technological Resources	4	65	22
Social Education	Integrated activity:		4	79	3
	1st	— Uses, Possibilities and Limits of Information and Communication Technologies.			
	2nd 3rd	— External Practices I. — Didactic Foundations of Socio-educational Action.			
Early Childhood and Primary Education	3rd	Virtual Learning Environments	2	12	4
Fine Art	2.º	Art Psychology and Gender Studies	1	56	6
	3.º	Contemporary Visualities	2	96	12
TOTAL		10	20	471	76

Finally, in the degree of Fine Art, students were encouraged to constellate the elements that had marked their learning during the subject, using images, authors, quotes, texts, etc. These constellations were nourished by the main aspects of the subject, which deals with how individual viewpoints are socially configured and what links we maintain with the images.

RESULTS

The teachers who participated in the project promoted the creation of flexible curricular spaces in 10 courses of the 5 bachelor's degrees, where 471 students developed research and problem-based projects, combining different disciplines, themes and interests. Each teacher adapted the DIY perspective to the context of their subject and consequently the project was put into practice through a diversity of teaching approaches and moments. Nevertheless, in all cases, regarding the production of the audio-visual objects reflecting their learning paths, the following moments were contemplated:

1. Starting point: students and teachers established at the beginning the goals and meaning of the inquiry-based project. The students were given information about the creation of an audio-visual production through which they could reflect and represent what they did, how they did it and what and how they have learnt.
2. Continuous process with an intermediate activity: the audio-visual productions were valued, supervised and shared during the semester. However, the productions were analysed and recovered in an intermediate moment to discuss how the production was being approached.
3. Course ending: the students represented the knowledge they built inside and outside the classroom, and the process of producing audio-visual narratives.

By the end of the implementation, the 471 higher education students had created 76 audio-visual productions in a collaborative way and they shared the results in the DIYLabHub (see table 1). Some of the groups of students decided not to share their productions in the hub.

In the next sections, we present the challenges and possibilities that the implementation represented at the pedagogical level, for teachers and the students that participated in the project. The results are organized into three sections that coincide with the dimensions of the analysis of the end of project discussion group.

Learning

Teachers emphasized that their involvement in the project had led them to make a series of changes in their subjects, related to the learning processes that they tried to promote among students. These changes had to do with:

- Connecting subjects or fields of knowledge.
- Addressing topics related to the subject, taking into account students' interest.
- Promoting authorship and collaborative work.
- Promoting a culture of sharing knowledge beyond the classroom.

Students agreed that a strong characteristic of the project was that it enabled them to establish connections and transfer knowledge between different disciplines and fields. They also highlighted the possibility to reflect and represent their own learning process through audio-visual stories, and share them with others.

On the other hand, teachers pointed out some difficulties associated with the DIY culture, such as feeling insecure about where the processes shared during the course would lead them. For example, when teachers oriented their classes towards the accomplishment of an examination or an essay, the product of the course would be the answers to the exam or the essay. However, when teachers proposed students to develop a research-based project and make audio-visual productions that represented their processes, trajectories or connections, it brought some confusion because they did not know what the results would be.

This methodological approach required greater autonomy by students and, in turn, it involved an increasing responsibility. Therefore, students considered necessary that teachers could give more autonomy to students who were already working autonomously and accompany more the students who were not used to it or those who had difficulties to manage a project. In all cases, students emphasized the importance of starting the course with the intention of leaving their comfort zone and doing things in other ways (Ellsworth, 2000).

We are used to a specific way of doing things and changing it all in a sudden creates a lot of uncertainty, and this is a problem since it affects the whole group [Final discussion group. Student 6]

According to teachers and students, another difficulty associated with the project was to promote creativity. From students' point of view,

teachers and students often share the idea that creativity is innate, whereas it is necessary to develop it. This was difficult to achieve during a semester.

Regarding digital competence, students expressed that they had improved their competencies related with the management of information and the use of digital tools. Some students learnt how to use new applications and substituted the old resources. Teachers also indicated that a strong point of the project was that students used both digital tools they already used and the new ones they wanted to learn. It was also mentioned that some students had more developed their digital competencies, especially those related to the use of new media, than teachers. Unlike the initial discussion groups, where teachers felt insecure about this situation, at the end of the implementation they recognized the potential to learn *with* students.

Finally, a difficulty identified by teachers was how to teach to represent changes in students' knowledge through an audio-visual production. According to teachers, it was difficult for students to make these changes explicit and usually teachers did not know how to help them.

Teachers' and students' attitudes and roles

From students' point of view, the DIY culture was related with an evolution of the role of the teacher, from transmitting information to being promoters of students' learning process. Students related this issue with the possibility of promoting different learning paths during the course. As this participant expresses, the fact that each student had specific objectives for the course and they were able to achieve these objectives through different trajectories favoured that each learner could advance at their own pace.

Each student sets his own goal, the starting point and the point you desire to achieve. I don't know to which extent proposing an assessment with a common goal will promote students' learning, since everybody goes at their own pace. [Final discussion group. Student 6]

Students recognized that it was difficult to transform their passive role into an active and participatory one. This had to do with the disorientation and anxiety caused by the lack of fixed guidelines. They had to make decisions constantly about what they wanted to explore in their projects, to narrate in the audio-visual productions and with which tools. Modifying the traditional roles of teacher and learner was considered a challenge. At the same time, students highlighted the importance that teachers could also assume a role of learners. A student who mentioned this idea emphasized that some teachers do not know how to react when a student knows more

about a subject than they do. In this case, the participant put an example related to video editing. She asked: what is wrong with a student who teaches?

The teacher has pride, but he can 'swallow' it in a specific moment. For example, if you know more about the video editing program... and I know less... I can make you explain the rest of the class... And there is nothing wrong with this, because you can learn about everything... The only thing is that sometimes it is not easy to 'swallow' your pride, especially if you are deeply rooted in higher education. [Final discussion group. Student 5]

Teachers recognized their discomfort when they felt lost, because the DIY culture puts the student at the centre of the learning process. The initial doubts and resistance, both from teachers and students, might be related with their fear of losing control. Nevertheless, at the end of the project, the participants agreed that their doubts and resistances turned into satisfaction.

The assessment was a controversial aspect and both teachers and students referred to the benefits and difficulties associated with assessing, in particular, the audio-visual productions. On the one hand, students emphasized the possibilities of considering the assessment not as an ending point, but as a process that guides learning. In addition, they emphasized that the students who produced a story about what they had learned during the course included a self-assessment and a recovery of what had been addressed during the course. Finally, they indicated a contradiction between teachers' discourse and practices related to assessment. The current discourse of many teachers in higher education was based on the premise that the process was more important than the qualification, but it was not always put into practice. Teachers valued the numerical qualification obtained in each subject a lot. Therefore, a challenge would be to create new ways to legitimize knowledge.

Sustainability of the DIY culture in Higher Education

Students who participated in the second discussion group were optimistic with the idea that the DIY culture could be sustainable in Higher Education, considering that the current social context is favourable to innovation and student-centred perspectives.

I think that we are at a very favourable time... It is a very sweet moment for incorporating such philosophies. We are in a maker - 'do your things' culture, personalize... [Final discussion group. Student 8]

An obstacle identified by students was that these kinds of proposals entail a lot of work for the teacher, since they have to accompany the whole students' learning process. Students progress at different rhythms and they use varied tools and resources. According to the students, this could lead to an excess of dedication for teachers.

Teachers also identified three favourable aspects, regarding the possibility of this project to be sustainable. First, DIY perspectives connect with the current notion of competence-based curriculum. Second, the universities have an increasing willingness to create synergies with other institutions. Thirdly, DIY perspectives allow expanding the classroom beyond the university. At the same time, they highlighted three challenges to make it sustainable:

- The assessment: the difficulty of evaluating the audio-visual productions.
- Transversality: the complexity of developing interdisciplinary proposals.
- Teaching transformation: teachers' difficulty for implementing changes in their teaching practice.
- Collaboration: the need to participate in a team to share experiences, doubts, successes and difficulties.

Some of the indications teachers gave to solve these difficulties were: to create a shared rubric from the beginning with students about the assessment of the productions, to develop new teaching skills and to assess by competences.

Finally, both students and teachers agreed that if this perspective is only inserted in one subject and it does not change the conceptions of a good part of the teaching staff, then it could lose its meaning and remain as an isolated experience.

DISCUSSION AND CONCLUSIONS

Promoting the transformation of a teaching and learning culture considering the DIY perspective requires a participatory, collaborative and democratic procedure. Participatory action research (PAR) and the different methods of producing information about the developed processes have proven to be appropriate ways to promote and document the transformation of a teaching and learning culture aimed to gradually convert the university into a learning institution (Domingo-Coscollola, Arrazola-Carballo & Sancho-Gil, 2016; Senge, 1990).

Regarding the contributions and practical consequences of the work carried out with the implementation of the DIYLab project in higher education, we highlight, as more significant, having been able to:

- Fostering a proactive attitude in teachers and students regarding the regulation of their own learning. In order to do this, we put an especial attention in rethinking the higher education mission in order to consider teachers and students' agency to direct their learning processes, to think critically, and to take responsibility for their own learning. However, this debate should involve all actors related to the university and should refer not only to knowledge but also to attitudes, affects and competencies (Wals & Jickling, 2002).
- Varying the role of students, thinking of them more as prosumers and authors of knowledge than as consumers (García-Galera & Valdivia, 2014). At the same time, shifting the teacher's role from information transmitters to students' learning promoters. Although this could seem something not new at all, this change has proven to be not easy. Placing the student at the centre of the teaching and learning process often produces disorientation, the feeling of not having control and doubts about the evaluation. In order to promote sound and sustainable change in the roles of teachers and students, it is necessary to legitimize other forms of evaluation and to recognize that teachers can be learners and students can also teach.
- Promoting the sharing of knowledge and learning in an open access digital platform (DIYLabHub), fostering transdisciplinarity, interculturality and inter-generacionalidad in the teaching and learning processes through the DIYLabHub. In this sense, Siemens (2008) points out that teachers traditionally control interaction and access to information. However, a social orientation of digital technology could allow a change in the access of students to information and in improving the dialogue with both educators and other students.
- Introducing a transdisciplinary view of knowledge through inquiry-based projects allowing multiple learning paths and the use of different languages and tools, taking into account the difficulties due to the current subjects and credits-based curricula. The project faced us to the need of evaluating the intricacy of the educational experience and rethinking the connections between subjects to better prepare individuals for a complex and accelerated world (Association of American Colleges and Universities, 2007).
- Demonstrating the improvement of skills, abilities and knowledge related to digital, reflexive, analytical, critical and research competencies, by promoting a student-centred, collaborative,

self-regulated, practice-oriented learning to share knowledge emphasizing affective goals, discovery and creative problem solving as argued by Wals & Jickling (2002).

- Paying more attention to the learning modalities and practices that take into account higher education students' diversity. Students learn at different rhythms, have different cultural backgrounds and hold different development levels in relation to skills and knowledge such as creativity or management of digital technologies. They also have more or less experience of working in collaborative and autonomous ways. We agree with the idea of the Massachusetts Institute of Technology that attending to the diversity of students implies

giving thought to the attitudes, beliefs and expectations of students as individuals, and considering how these influences their approaches to learning and their interactions with yourself [as a teacher] and with peers in the design of curricula, in the translation of curricula into day-to-day teaching and learning, and in the assessment of learning. (Massachusetts Institute of Technology, n.d.)

The implementation of this project has allowed us to show some of the institutional limitations related to the rigidity of curricula, the institutional inertia, the fragmentation of space, time and knowledge, the persistent traditional notions of knowledge and learning (Scott, 2012) and the challenge teachers face to legitimise students' knowledge in the evaluation process (Sancho-Gil, Sánchez-Valero & Domingo-Coscollola, 2017). We have explored students' interests and learning experience inside and outside the university. Many students were committed to what they did and showed interest in learning in collaboration with other students and teachers. Faced with this reality, we have sought to move towards a higher education for the 21st century learning.

The limitations of this project are not to be found in the methodology and the methods implemented, but in the challenge of introducing, in a traditional institutional culture, learning perspectives and collaboration practices better developed in non-formal environments where other ways of learning, communicating and relating are allowed and valued. At the moment (after finishing the European project), as teachers and researches, we continue to deepen the articulation of inquiry-based projects that promote the six characteristics of DIY learning mentioned above: creativity, collaboration, self-regulation, authorship, sharing and use of technologies. We are also in the process of further developing the analysis of audiovisual productions as modes of representation and transfer of learning and knowledge.

SUPPORTS

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