



Do it yourself in Education: Expanding Digital Competence to Foster Student Agency and Collaborative Learning – DIYLab.

Final Report

Public Part

## Project information

Project acronym: DIYLab

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## Executive Summary

The main aim of this project was to promote lifelong and life-wide learning by expanding students' digital competence, agency, and creativity through the introduction of DIY philosophies into formal education institutions. It also intended to foster engagement among primary, secondary and higher education students by developing collaborative, meaningful and authentic learning experiences that will be sustainable beyond the lifespan of the project.

To foster stakeholders' involvement and the sustainability of the project, we have used a methodology based on the principles of Collaborative Action Research (CAR). Each project's work package (WP) represented a cycle of the CAR process involving all participants.

Throughout the duration of the project the following objectives have been achieved:

- Identify what participant institutions recognized as best practices in developing key competences, and especially digital competence. We analysed: (a) the primary and secondary school curricula of the three participating countries (Spain, Finland and Czech Republic), and of several degrees in Spain and Czech Republic universities; (b) the technological infrastructure of all implicated institutions. We also carried out 20 focus groups with 36 primary and secondary school students, 34 teachers and 33 parents, and 33 higher education students and 6 teaching staff.
- Prepare the implementation phase by developing a collaborative professional development process — with researchers, teachers and administrators – to design a conceptual and theoretical framework that supports participants in moving from being information consumers, to knowledge producers. As a result, we created DIYLab specifications for each institution.
- Develop and implement the DIYLabHub: <http://hub.diylib.eu> that displays all the digital objects created by students as Open Educational Resources, to support the growth of an open, cross-cultural learning community. By the end of the project it contained 232 DIY digital objects produced by participant students who agreed to publish them.
- Carry out the implementation of DIYLabs in participating primary and secondary schools and universities. DIYLabs were understood as flexible spaces for developing cross-curriculum projects where participants introduce, develop and use inquiry-based projects connecting different class subjects and students' interests. It involved 478 students and 36 primary and secondary school's teachers; 713 university students and 28 teaching staff.
- Appoint external peer reviewers for the implementation of the quality assurance plan.
- Carry out the evaluation of the DIYLabs implementation, through: a) 15 focus groups which involved students, teachers and parents from primary and secondary school and higher education (164 participants); b) local reports analysis in order to produce Improved DIYLab specifications for each involved institution.
- Undertake a socio-economic evaluation to assess the impact of the introduction of a DIYLab into schools and universities.
- Organise: a) 8 all-day workshops and 5 half-day knowledge seminars with 383 stakeholders and 349 participants from educational sector, with the aim at helping other schools and/or communities adopt the DIYLab methodology; b) a wrapping up International Symposium in order to close the knowledge transfer and information process. It involved 113 participants.
- Disseminate processes and results through the project website (<http://diylib.eu/>), social networks, international and national conferences, and referred papers.

## Table of Contents

<b>1. PROJECT OBJECTIVES</b>	<b>5</b>
<b>2. PROJECT APPROACH</b>	<b>6</b>
<b>3. PROJECT OUTCOMES &amp; RESULTS</b>	<b>9</b>
<b>4. PARTNERSHIPS</b>	<b>16</b>
<b>5. PLANS FOR THE FUTURE</b>	<b>18</b>
<b>6. CONTRIBUTION TO EU POLICIES</b>	<b>20</b>
<b>7. REFERENCES</b>	<b>20</b>

# 1. Project Objectives

The main aim of DIYLab project was to promote lifelong and life-wide learning by expanding students' digital competence, agency, and creativity, by putting into practice DIY philosophies. Also, to foster primary, secondary and higher education student engagement by proposing collaborative, meaningful and authentic learning experiences that can be sustainable and expandable after the end of the project.

The specific objectives were:

1. Analyse how digital competence can be better integrated in curricula and connected to learning outcomes, not only at all levels of formal education but also in informal and non-formal learning, drawing on previous knowledge of all participants and the teaching and learning expertise of school administrators and teachers, students and parents. (WP1)
2. Build a conceptual and technical approach through a collaborative formation process - with researchers, teachers and administrators, that allows participants to move from being information consumers, to knowledge producers, by fostering digital competence. (WP2)
3. Use a digital hub to support the growth of an open, cross-cultural learning community in order to develop transversal competences such as: learning to learn, entrepreneurship, collaboration, multiculturalism and autonomy, to create a resource that is transversal across different languages. (WP3)
4. Draw on the Do it Yourself (DIY) culture - designing, creating, sharing, learning -to create a DIY Lab; a flexible space for developing transversal curriculum projects where participants introduce, develop and use inquiry-based projects connecting different class subjects and reflecting students' interests. (WP4)
5. Through an action research process, assess the design and implementation of the DIY Lab — with researchers, teachers, administrators and students — in order to make sustainable improvements to the DIY Lab in each school context. (WP5)
6. Undertake a socio-economic evaluation to assess: a) the social impact of the DIY Lab space, in primary, secondary and higher education; b) the cost and implied savings of the introduction of a DIY Lab into schools and higher education institutions. In order to achieve this, quantitative and qualitative data gathering methods will be used. (WP6)
7. Disseminate and exploit the process and results of the project among all relevant stakeholders, and the general public. Make a significant and original contribution to the field, regarding the benefits and challenges of developing and maintaining a DIY Lab in educational institutions. (WP7, WP8)

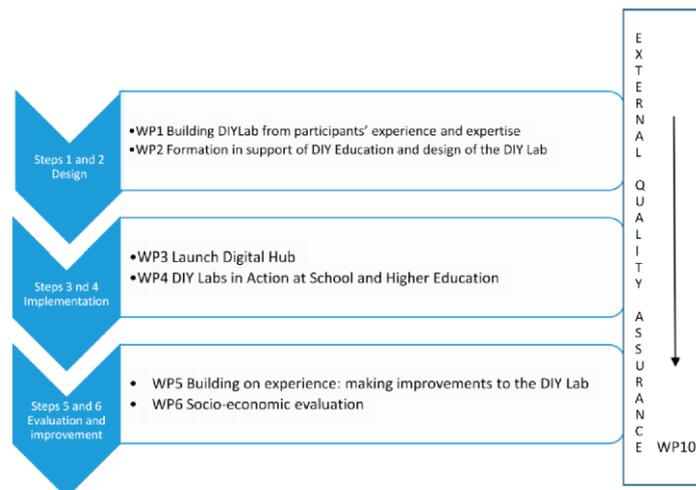
## 2. Project Approach

### Methodology

DIYLab was an educational project, based on the DIY culture (authorship, creativity, cooperation and sharing) that enabled schools and universities to develop digital competence as a result of the exchange between teachers, students and external collaborators. It allowed schools to break their boundaries and put students and teachers in contact with participants from other European countries, generating exchanges that fostered not only the sustainability of the pedagogical approach, but also its improvement.

To achieve the project's objective, the consortium 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, . . . [that] seeks to bring together action and reflection, theory and practice, in participation with other" Reason and Bradbury, 2001:1).

Each project's work package (WP) represents a cycle of the CAR process involving all participants.



Building on this foundation, in the different phases of the project, we have used complementary methods to collect data (Green, Camill & Elmore, 2006), both to ground the process of reflection-action-reflection that fostered a culture of collaboration, discussion and purposeful inquiry as the engine at the heart of DIYLab's innovation and sustainability; and generated conceptual knowledge and educational contexts beyond the state of the art.

### Milestones (at the end of):

- WP1 we had a clear understanding of the situation regarding digital competence and self-regulated learning in all the participating institutions, after conducting focus groups in each of them (142 people took part in the focus groups (40 primary, secondary and higher education teaching staff, 33 primary and secondary students' parents and 69 primary, secondary and higher education students). And analysing the primary and secondary schools' curricula of Spain, Finland and Czech Republic, and the study plans of five degrees in Spanish and Czech universities.

- Month three the project had a website where to disseminate the results of the project as they are released: <http://diylab.eu>. All public results and deliverables can be found there.
- WP2 we completed the professional development to the 60 teachers participating in the implementation to the DIY philosophy in primary secondary and higher education. The implementation plan was developed in collaboration and tailor made for each context.
- Year one we had a working DIYLabHub: <http://hub.diylab.eu>, a website to share all the digital objects created by schools and universities students in DIYLabs
- Year two we introduced the DIYLab in two universities and three primary and secondary schools, involving 1191 students and 64 teachers. The results of this implementation are accessible in the public deliverable 4.6 The DIY labs in action - General Report, and the DIYLabHub.
- WP5 we evaluated the implementation by using feedback from 15 focus groups (of teachers, parents, and students) and the pedagogical and technological specifications of DIYLabs in schools and universities were revised.
- WP5 we had a socio-economic evaluation of the costs and benefits of considering the DIY philosophy, as implemented in DIYLabs, in schools and higher education.

## Evaluation

The evaluation of DIYLab project has consisted of:

1) The evaluation of DIYLab's implementation through focus group with stakeholders. The relevant topics arisen from those focus groups were: a) DIYLab activities; b) attitudes and roles; c) technological aspects during the implementation; d) influences, transfers and cooperation emerged; e) sustainability of the project; f) students' assessment; g) other issues not taken into account in the main topics table.

The results of this evaluation were:

- Teachers understanding of the DIY philosophy and how to incorporate it in education was essential. Teachers involved in the project can ensure its sustainability once implemented, being necessary to develop a new long-term organizational plan and enabling the curriculum to carry out complex projects such DIYLab.
- The implementation of DIYLab in education yields to teachers' new ideas and new forms of how to teach, and offers to learners new ways to learn and understand what they learn.
- The most challenging problem was to capture the process of creation, learning, and how to describe, visualize and share these processes.
- Thanks to DIYLab activities, the students discovered what they are able to do, and that they had the ability to work in teams. Moreover, they were more motivated and in general learned to self-regulate themselves and in a more meaningful manner.

2) Socio-economic evaluation of DIYLab project. The DIYLab project identified a set of possible educational-social benefits and a set of costs to be taken into account to foster its sustainability and possible scalability to other contexts:

Educational-Social Benefits	Collateral Effects
- Potential mitigation of teachers' fear and anxiety regarding digital technologies	- The proliferation of DT resources and applications overwhelms teachers with no time to be updated.
- Potential reduction of school/university disaffection and dropout rates	- Tensions between a self-managed philosophy and the obligations imposed by educational institutions.
- Potential reduction of the digital divide.	- The intensive technological development and slow investments in education can increase social inequalities and the digital divide.
Costs	Implies
- Setting up and maintaining a DIYLab	- Cost related to the analysis of current teaching practices, the professional development of educators, and the design of the DIYLabs (how, why, where, who, which equipment).
- Time investment needed by educators and other educational actors, also taking students into account.	- Who will pay the cost related to the time invested in the different phases of the innovation? Will it be the responsibility of teachers or the institution? Should the teaching and learning schedule be changed? Should the institutional space be modified?
- Equipment and software needed	- Cost related to the acquisition and maintenance of the technological infrastructure. Previewing the social impact of bring-your-own-devise philosophy.

The socio-economic evaluation has allowed us to make explicit the possibilities, tensions and difficulties we have faced.

### Dissemination and exploitation

The dissemination and exploitation consisted of:

- 1) Carrying out 8 workshops connecting DIY culture with DIYLab project and other similar innovative pedagogies: 3 aimed at primary school community; 3 aimed at secondary school community; 4 aimed at university community.
- 2) Reaching a wider stakeholder population by organising a 5 half-day knowledge transfer seminars (two in Spain and Czech Republic and one in Finland), aimed at lower and higher education, where connecting DIYLab project with contemporary educational concerns.
- 3) Organising a wrapping up international symposium. The program consisted of examples of the presentations related to the DIYLab project and connected educational perspectives, panel discussions, dialogue with invited experts and keynotes.
- 4) Publishing a book, and 5 refereed papers. We are in the process of publishing three more papers and a monograph topic in a journal addressed to practitioners.
- 5) Giving 4 invited lectures and submitting 34 papers and posters to international conferences.

The evaluation and the dissemination and exploitation strategies have contributed to explore those strategies that can assure the sustainability of the project.

### 3. Project Outcomes & Results

#### **WP 01. Building DIYLab from participants' experience and expertise**

- The main aim of WP1 was to identify what participant institutions recognized as best practices in developing key competences, and especially digital and learning to learn competence, taking into account the purposeful learning experiences implemented in each institution to foster lifelong and life-wide learning. We used complementary methods to collect data (Green, Camilli & Elmore, 2006), with the purpose of fostering the process of reflection-action-reflection, while developing a culture of collaboration, discussion and purposeful inquiry. The methodology developed and discussed in this report represents the initial step in this cycle.
- A total of 142 stakeholders participated in this WP. 40 primary, secondary and higher education teaching staff, 33 primary and secondary students' parents and 69 primary, secondary and higher education students, from partners' schools and universities, participated in the focus groups.
- In this WP were produced 5 confidential local deliverables (Local Report): 1.1(Spanish Primary and Secondary School); 1.2 (Spanish Higher Education); 1.3 (Finnish Primary and Secondary School); 1.4 (Czech Primary and Secondary School); 1.5 (Czech Higher Education). And a final report: D1.6 Report on Digital Competence in Schools: Spain, Finland and the Czech Republic (Public). Available at: <http://diylab.eu>
- One of the most relevant finding of this WP was to identify the obstacles and challenges according to the key focal points of DIY learning related the following teaching and learning dimensions: 1One of the most relevant finding of this WP were to identify the obstacles and challenges according to the key focal points of DIY learning related the following teaching and learning dimensions.
  - *Autonomous and self-regulated learning.* The role of the teacher is displaced or unsettled with the introduction of a model structured around self-regulated learning. The importance of revising possible teaching inertias will be key. Such inertias tend to place the teacher as actor and pupils as receptors, according to the "hydraulic theory of education" (O'Shea and Self, 1983: 67). The challenge will be to confront the tension between a transmission model of teaching focused on the teacher and/or a reconstructive teaching and focused on the pupils.
  - *Inquiry-based teaching and learning.* When the pedagogical model shifts, assessment frameworks need to be addressed. Students (and parents, too) are suspicious if they detect a lack of transparency in the evaluation system, and that could undermine the success of the project.
  - *Transdisciplinary or interdisciplinary knowledge, links and connections.* DIYLab activities should support inquiry and spontaneity, not create another restrictive structure that competes with the rigid classroom schedule. The aim in designing the DIYLabs should be to find ways for them to reside in the schools without being too inhibitive. Digital competence... Is not only for students! Teachers need training and assistance in order to feel competent with certain technologies and they need guided exposure to programs (i.e., Scratch, Prezi, YouTube, and augmented reality) before introducing them to students.
  - *Collaborative learning.* There is a strong need to clarify what is involved in the practice of learning in collaboration: the challenge of going from working in a group seen as a sum of parts, each one doing their bit, to a setting that provides the

multiplication of results where the total is more than the sum of the parts.

- *Opportunities and limitations for anchoring the DIYLab program to the curriculum.* Building on existing activities and practices has been identified as an optimal way to approach the design of the DIYLabs. The focus groups provided a number of suggestions about what DIY learning looking like currently in each context and this information needs to remain at the fore as the project moves forward.

## **WP 02. Formation in support of DIY Education and design of the DIY Lab**

- In this WP, the pedagogical and technological specifications of the DIYLab in each institution were designed, according to the criteria established during the pedagogical and technological professional development process. Five deliverables (DIYLab Specifications) for internal use (confidential) gathered up how the DIYLab would be implemented at each institution. They also provided indicators for monitoring digital competence: 2.1 (Spanish Primary and Secondary School); 2.2 (Spanish University); 2.3 (Finnish Primary and Secondary School); 2.4 (Czech Primary and Secondary School); 2.5 (Czech University). The final report analysed and summarised the design of the DIYLab model in different educational contexts: D2.6 Developing a DIYLab in Primary, Secondary and Higher Education (Public). Available at: <http://diylab.eu>
- With the help of this report, involved schools and universities could compare, and develop their own approach further, towards the core content of the DIYLab. Because of this, the report reflected more development processes than final conclusions. The key topics of the DIYLab specification were about: a) the pedagogical principles of DIYLab culture in our institution and; b) how they relate with curriculum and available digital technologies.
- As a part of this WP a video showing professional development process and key educational issues of Spanish primary, secondary and university teaching staff was produced. Available at: <http://diylab.eu>

## **WP 03. Launch Digital Hub**

- The main objective of this WP was building on the basis of existing free and open source CMS (Content Management System, e.g. WordPress) an appealing and functional website to present the digital objects created by the students. The design was informed by the work done in WP1. This website was designed taking into account the different languages in which it has to be accessible, current web design trends (responsive layouts, HTML5) and accessibility concerns.
- This is the website the whole consortium uses to publicly share the digital objects created during the implementation of the project as a whole. It shows the DIY digital objects produced (individually or in group) by those students willing to share their visual reflection about their learning process. It also serves as a communication hub for all of the participants and other institutions (by now EINA Centre Universitari de Disseny i Art de Barcelona) implementing DIYLab principles.
- Each post (DIYLab Digital Object) should contain: a) summary in English; b) the 'thing' we want to share; c) how did we do it; d) why we did it this way; e) what we have learnt.
- At this moment, there are 232 DIY digital objects. These objects have a visual and multicultural perspective to foster their transferability and understanding by other different European (and international) viewers. Therefore, this is a tool to support the implementation and help to share it within and outside the consortium. (Public): <http://hub.diylab.eu>

#### **WP 04. DIY Labs in Action at School and Higher Education**

- The main aim of this WP was the implementation of DIYLabs in participating schools and universities, to foster the acquisition and development of digital competence, creativity, collaborative learning and self-regulated learning. This WP involved:
  - 478 5<sup>th</sup> and 9<sup>th</sup> grade students and 36 teachers (in 3 primary schools and 3 secondary schools)
  - 713 university students and 28 teaching staff (in 2 universities - 2 Faculties of Education and 1 Faculty of Fine Arts).
- The implementation was carried out according to the DIY Lab Specifications designed for each educational institution, under the basic understanding of being flexible spaces for developing cross-curriculum projects where participants introduce, develop and use inquiry-based projects connecting different class subjects and students' interests. Schools and universities used available equipment to allow students and teachers to develop cross-curriculum DIY digital objects, shared via the DIYLabHub (WP3).
- The coordinating partner provided guidelines for implementing DIYLabs in the participating institutions and tools to follow and assess the implementation process.
- The compilation of the material generated from the implementation was carried out in each institution, with confidential reports (The DIYLab in action) summarizing the implementation of the DIYLab: D4.1 (Primary and secondary school, Spain); D4.2 (Spanish University); D4.3 (Primary and secondary school, Finland); D4.4 (Primary and secondary school, Czech Republic); D4.5 (Czech University). The coordinating partner used these reports to generate the final public report (D4.6. The DIYLab in action - General Report, available at <http://diylab.eu>)
- This report contains a summary of the main achievements, results and challenges of DIYLabs, and provides stakeholders (schools, universities, policy makers, etc.) with a view of how to consider DIY culture to foster digital competence and support lifelong and life-wide learning. The report concluded that the whole implementation process was influenced by both the preparation of DIYLab activities within the WP02 and implementing the activities into the existing curricula. It was essential that teachers understood the DIY philosophy and how to incorporate it in education. The teachers involved in the project can ensure its sustainability once implemented. The most challenging problem was to capture the process of creation, learning, and how to describe, visualize and share these processes.

#### **WP 05. Building on experience: making improvements to the DIY Lab**

The objectives for WP5 were:

- Identify and analyse the strengths and weaknesses of DIYLabs, stressing on the development of digital competencies and the feasibility of the implementation of DIY philosophy in formal education.
- Draw up specific recommendations for improving the implementations of DIYLabs.
- Regarding the key purposes of the project and based on the earlier work in WP1, teachers, students and families were also involved. In WP5, all countries organized focus groups and gathered data and findings about the implementation of the DIYLabs.
- The focus group discussion involved:
  - 66 5<sup>th</sup> and 9<sup>th</sup> grade students, 29 teachers, and 26 parents (in 3 primary schools and 3 secondary schools)
  - 30 university students and 13 teaching staff (in 2 universities - 2 Faculties of Education and 1 Faculty of Fine Arts).
- In each country, University members of the project coordinated the conversations and explained to attendees that the aim of the meeting was to share experiences, in relation to the implementation of the DIYLab, in order to promote reflection, as well as to explore the

implementation from different perspectives. The coordinators used an open questionnaire prepared by the coordinating partner, to allow all partners to work with the same guidelines and afterwards, to be able to share and compare similar information.

- The information generated from the WP5 was collected by each institution that also produced 5 confidential reports (Evaluation and Revised DIY Labs Specifications) summarizing the focus groups results: D5.1 (Primary and secondary school, Finland); D5.2 (Primary and secondary school, Czech republic); D5.3 (Primary and secondary school, Spain); D5.4 (Higher Education, Czech republic); D5.5 (Higher Education, Spain).
- The coordinating partner used these reports to generate the final report: D5.6. Implementing a DIY Lab in the primary and secondary school and in higher education, available at <http://diylab.eu>
- This report builds on the findings and analysis of the local reports according to the country and the institutions. That is, it collects the outcomes thematically, from all the countries of the project and the involved schools and universities.

### **WP 06. Socio-economic evaluation**

The objectives for WP6 were:

- Evaluate the social impact of the DIYLab philosophies in primary, secondary and higher education in terms of:
  - the potential reduction of school disaffection and dropout rates;
  - the mitigation of teachers' fear and anxiety regarding digital technologies;
  - the impact on the digital divide.
- Identify the economic impact in terms of:
  - setting up and maintaining a DIY Lab;
  - the needed equipment and software;
  - the time investment needed by teachers and other educational actors.
- This evaluation drew on the data collected during the implementation (WP4) and co-assessment (WP5) of the project, in addition to conducting series of interviews with relevant stakeholders in each country (school administrators, teachers, students, parents, educational authorities). It involved:
  - Compilation the information generated from the WP6 activities carried out in each institution and 3 confidential reports summarizing the socio-economic evaluation. The coordinating partner used these reports to generate the final report. D6.1. Socio-economic evaluation report, Spain (public), available at <http://diylab.eu>
- This report analyses and interprets data about the social and economic aspects that can spur or inhibit lifelong and life-wide learning skills related to the development of digital competence. Taking these features into account it can help educational systems to better plan their investment in digital technologies and teacher professional development.
- Considering the socio-economic dimensions of the project, it has allowed us to make explicit the possibilities, tensions and difficulties we have encountered. This knowledge will guide our next steps in innovation, once the European project is over, and can help educators and institutions to responsibly implement digital technology-driven innovations.

### **WP 07. Dissemination**

In the early stages of the project it was created a dissemination strategy, revised in month 15 and 27.

- The performed disseminated actions have been:
  - o The project's website that includes the project rationale and objectives, as well as

- all the publicly available documents generated during the project's lifetime.  
<http://diylab.eu/>
- o Social media: Facebook: <https://www.facebook.com/diylabcommunity>; Twitter: [https://twitter.com/DIY\\_Lab](https://twitter.com/DIY_Lab); Google+: <https://www.youtube.com/watch?v=8u-wtbCZq9c>
  - o **Participation in conferences** (all of them available in the project website):
    - 18 papers submitted at international (13) and national (5) conferences
    - 2 Posters: 1 at international conference and 1 at national conference.
    - 3 Keynotes: 1 at international conference and 2 at national conferences.
    - 1 National Conference.
    - 1 Online Presentation at national conference.
    - 1 Invited lecture at international conference.
    - 1 Workshop at international conference.
    - 4 Presentations at International Symposia
  - o **Papers** (all of them available in the project website):
    - Sancho-Gil, J. M., Hernández-Hernández, F. & Fendler, R. (2015). Envisioning DIY learning in primary and secondary schools. *Seminar.net. International Journal of Media, Technology & Lifelong Learning*, Vol 11.-issue 1.
    - Domingo-Coscollola, M., Arrazola-Carballo, J., & Sancho-Gil, J.M. (2016). Do It Yourself in education: Leadership for learning across physical and virtual borders. *International Journal of Educational Leadership and Management*, 4(1), 5-29. doi:10.17583/ijelm.2016.02.
    - Sánchez, J.A., Arrazola, J. & Calderon, D. (2015). El proyecto DIYLab (Do It Yourself in Education: Expanding Digital Competence to Foster Student Agency and Collaborative Learning). *EnTERA2.0*, 2, 46-56.
    - Sancho-Gil, J. M. & Rivera-Vargas, P. (2016). The Socio-Economic Evaluation of a European Project: The Diylab Case. *Informatics*, 3, 13, 1 -17. doi:10.3390/informatics3030013. <http://www.mdpi.com/2227-9709/3/3/13>
    - Sancho Gil, J. M., Hernández-Hernández (2016). Una visión amplia y compleja de la tecnología. Trayectoria, transiciones y posiciones de un grupo de investigación. *Educação Unisinos*, 20(3), 326-336. doi: 10.4013/edu.2016.203.06. <http://revistas.unisinos.br/index.php/educacao/article/view/11612>
  - o **Books**:
    - Hernández-Hernández, F.; Sancho-Gil, J. M. (coord.) (2017). La perspectiva DIY en la universidad: ¡hazlo tú mismo y en colaboración! Barcelona: Editorial Octaedro.

## WP 08. Exploitation

- The aims of WP8, coordinated by P2, were to:
  - develop an exploitation strategy,
  - produce workshops, seminars and a symposium,
  - document the exploitation activities and produce an impact report.
- In coherence with the strategy developed in D8.1 (confidential), the following public exploitation activities were implemented:

D8.2 Primary School Workshop - Spain.

D8.3 Secondary School Workshop - Spain.

D8.4 Higher Education Workshop - Spain.

D8.5 Primary School Workshop - Finland

8.6 Secondary School Workshop - Finland

D8.7 Primary School Workshop - Czech Republic

D8.8 Secondary School Workshop - Czech Republic

D8.9 Higher Education Workshop - Czech Republic

D8.10 Knowledge Transfer Seminar - Lower Education - Spain.

D8.11 Knowledge Transfer Seminar - Higher Education - Spain.

D8.12 Knowledge Transfer Seminar - Lower Education - Finland

D8.13 Knowledge Transfer Seminar - Lower Education - Czech Republic

D8.14 Knowledge Transfer Seminar - Higher Education - Czech Republic

D8.15 International symposium Focusing on the learner. The Diylab Philosophy at School and University to Foster Student Agency and Collaborative Learning.

- Workshops, seminars and the international symposium were privileged forums to transfer knowledge gained by the consortium by implementing DIY culture in formal education systems. As well as to share practices and experiences from schools and universities with a wider audience: primary and secondary school teachers, higher education staff, policy-makers and stakeholders.
- The documents generated from the WP8 through the activities carried out in each institution were synthesized in D.8.16 Impact Report: Exploitation (Confidential). However, we edited set of short videos from each workshop, seminar and the international symposium, which are available at <http://diylab.eu>

## **WP 09. Management**

- The management of the project (coordinated by P1) has followed and smooth, implicated and responsible collaboration process. From the very beginning partners have shared a virtual space to foster communication and exchange. Besides the explicit deliverables, we keep track of communication exchanges and have maintained virtual meetings (most of them through “hung out” and recorded) every two/three month. The financial project manager has also maintained a fluid communication with the partners, making sure all their quests were answered. The specific deliverables have been.
- The coordinating partner, with the collaboration of all consortium members, produced a report that includes a summary of the principal results obtained in the first year of activities, both referring the project implementation and the partnership construction and consolidation. A draft of the report was disseminated to partners before the management meeting in Month 13.

### **D9.4 Intermediate Management Report, Spain (Confidential)**

- Partners discussed the on-going tasks, revised the work done so far and concentrated on the more immediate tasks ahead (WP5; 6, 8). During the mid-project meeting, partners revised and discussed the external quality assurance reports (D10.1, D10.2, D10.3) to reflect on the project’s process and prepare for the next stages. The “minutes” documented the discussions and decisions taken during the meeting were published internally. The coordinating partner supervised the organization meeting and delivered

the following document:

D9.5 Intermediate management meeting, Czech Republic (Confidential)

- The coordinating partner, with the collaboration of all consortium members, produced a report that includes a summary of the principal results obtained in the second year of activities, both referring the project implementation and external quality assurance and the partnership consolidation. A draft of the report was disseminated to partners before the management meeting in Month 25.

D9.6 Intermediate Management Report, Spain (Confidential)

- During the final project meeting, partners revised and discussed the external reports (D10.4, D10.5, D10.6) and the final management report (D9.7). The main task of this meeting was to develop a detailed dissemination and exploitation strategy for the time immediately following the end of the project (for two years) and discuss future possible funding opportunities. The “minutes” documenting the discussions and decisions taken during the meeting were published internally. The coordinating partner supervised the organization meeting and delivered the following document:

D9.7 Final Management Meeting, Spain (Confidential)

- The consortium several videoconferences per year to maintain efficient project coordination. Meetings, lasting two hours, addressed the most immediate tasks on hand and resolved any emerging problems or issues. Meetings took place on Google Hangout and all partners were involved. The coordinating partner supervised the organization of all the project meetings and the production of the minutes.
- The coordinating partner, with the collaboration of the whole consortium, produced a report that includes an executive summary of the results during the lifespan of the project, referring to the methodology and impact of the project and taking into account the external reviews. A draft of this report was published internally by the coordinating partner before the final meeting in Month 36 and then revised according to the feedback from other partners.

D9.9 Final Management Report, Spain (Public), available at <http://diylab.eu>

- This report is an overview of the activities carried out in each one of these work packages. The coordinating partner, with the collaboration of the whole consortium, produced a report that includes an executive summary of the results during the lifespan of the project, referring to the methodology and impact of the project and taking into account the external reviews. A draft of this report was published internally by the coordinator partner before the final meeting in Month 36 and then revised according to the feedback from other partners.
- The main conclusion is that It has been three years full of challenges and hard work. The project designed has proven successful, but not without issues that need to be taken into account for the sustainability of the innovation we proposed and implemented. The DIY culture may be a guiding light, but things can't change overnight. Therefore, we have to strive to work with others in making education, at all levels, better, and more suited to the students of today.

## **WP 10. Quality assurance**

- Quality Control Assurance was based on an external peer review system. The project developed three external steering committees, one per country, comprised of a group of experts (policymakers, academics, and professionals from the education sector). The steering committees revised the correspondence of the achieved results with the planned results, and the consistency between these results and the specific objectives that the project intends to satisfy, as well as features considered from the target group.
- Each external steering committee developed in English two documents (Intermedia report,

Final report). The members of each steering committee worked in collaboration. The steering committee operated from January 2015 to November 2016 in two phases:

- Phase 1: The end of the DIYLab implementation (January – December 2015)  
The external steering committee revised the Project Description, documents D1.6, D2.6, D4.6, DIYLabHub and digital objects published on DIYLabHub, and in accordance with a particular country also documents D4.1-4.5
- Outcomes: External Quality Assurance Intermediate Report (confidential) from each country: D10.1 (Spain); D10.2 (Finland); D10.3 (Czech Republic).
- Phase 2: The end of the DIYLab implementation (January – November 2016)  
The external steering committee revised the Project Description, document D5.6 and in accordance with a particular country also documents D5.1-D5.5
- Outcomes: External Quality Assurance Final Report (confidential) from each country: D10.4. (Spain); D10.5. (Finland); D10.6. (Czech Republic).
- The coordinating partner used the 1<sup>st</sup> and 2<sup>nd</sup> phase's reports to generate the final report: D10.7. External Quality Assurance Final Report, Spain (Public), available at <http://diylab.eu>
- According to this report, all key performance indicators defined in the project proposal have been achieved. All the partners involved in DIYLab project in collaboration with DIYLab activities' participants, pupils, students, parents, university teachers and teacher educators appreciate DIYLab as a promising, reasonable and progressive approach to learning which is transferable to all levels of education including university level and teacher education (both initial teacher education and continuing professional development).

## 4. Partnerships

### **P1 University of Barcelona (UB)**

The UB has led WPs 1, 3, 6, 7, and 9, and has actively participated in the rest of the WPs. As project leader, has had a prominent role in assuring a strong and successful exploitation and dissemination process as well as providing the necessary interface with the Project Representatives of the EC. The partner team has long experience in conducting qualitative research in educational and social contexts, working in close connection with educational organizations, teachers and the wider educational community to foster educational innovation.

**Participants:** Juana M. Sancho, Fernando Hernández, Anna Majó, Judit Onsès, Xavier Giró, Cristina Alonso, Joan Anton Sánchez, Maria Domingo, Rachel Fendler, Raquel Miño, Judith Arrazola. Collaborators: Àngels Armengol, Anna Forés, Pablo Rivera, Leticia Fraga, Diego Calderón, Adriana Ornellas, Elisabet Higuera, Fernando Herraiz.

### **P2 University of Oulu, Extension School and Teacher Training School (UOULU)**

UOULU has led WPs 2, 5, 8 and has actively participated in the rest of the WPs. As WP leader for the formation (WP2) and co-assessment (WP5) stages of the project, UOULU lent to the project their expertise in teacher training and community outreach. UOULU was particularly suited to manage the project exploitation plan (WP8), and drew on its long experience in continuing education to design and implement effective, far-reaching knowledge transfer seminars and workshops.

**Participants:** Antti Peltonen, Mikko Ojala, Paula Airaksinen, Esa Niemi, Kari Kumpulainen,

Kerttuli Saajoranta, Seija Blomberg, Pasi Hieta, Terhi Ylöniemi, Anna-Leena Ahlfors-Juntunen, Hannu Juuso, Heikki Kontturi, Heli Heino, Matti Mikkonen, Rikka Küveri Raappana, Terho Granlund, Virpi Sivonen Sankala.

### **P3 Charles University in Prague (CUNI)**

CUNI has led WPs 4 and 10 and has actively participated in the rest of the WPs. As WP leader for the implementation phase (WP4), CUNI had a key role in the project. It used its long experience in coordinating R&D projects in schools to ensure an effective and efficient implementation strategy, exploiting its expertise in managing school collaboration in local/national/international ICT projects. This experience also permitted CUNI to manage the project's quality assurance (WP10), by establishing and overseeing the external steering committees and informing the project leader of its results. Finally, CUNI's close ties to schools and its experience in teacher training, notably with researching teachers' approach to ICT education, made it a strong partner to ensure the success of all WPs.

**Participants:** M. Černochová, T. Jeřábek, I. Fialová, Z. Trnková.

### **P4 Escola Virolai (VIROLAI)**

Escola Virolai has had a key role in carrying out WPs 1, 2, 4, 5, and 9. The partner team was the local expert who interfaced between the project and the school institution to ensure the following tasks: build and implement focus groups (WP1), coordinate the professional development process (WP2), oversee the daily tasks involved in implementing the DIY Lab (WP4), and generate the final assessment of the experience (WP5). The school also participated actively in the dissemination (WP7) and exploitation (WP8) of the project, with a key role in reaching local stakeholders and in the development of the workshops for the primary and secondary school sectors. As partner, the school was present for all managerial tasks and decisions (WP9).

**Participants:** Coral Regí, Maria José Miranda , Paloma Llaquet , Alejandro Pérez, Alfred Garrido, Ana M. Garcia, Benet Martin, Carol de Britos, Cristóbal Aviles, Isabel Beltrán, Joan Carles Moreno, José Luís Tourón, Maite Sillero, María Terea Pérez, Robert Pujol.

### **P4 ZŠ Korunovační (KORUNKA)**

ZS Korunovacni has had a key role in carrying out WPs 1, 2, 4, 5, and 9. Due to experiences and involvement with a parent community into collaboration with the school, and due to a philosophy "Creative school" focused on creativity development in learning, teaching and thinking, P5 guaranteed the building and cooperation with focus groups (WP1), and participated in the formative process (WP2), integrated ideas and principles of DIY and enriched learning and teaching activities into DYILab by ideas, projects and learning object design (WP4) and with a deep sense for responsibility to do self-reflection of gained experiences, contributed to (WP5). The school was active and took initiative in dissemination of ideas and project outcomes (WP7) and in exploitation of knowledge and expertise not only in next steps of school curriculum and teaching approaches, but also in collaboration with local stakeholders. The school will continue in the future in DIY principle in school life as a part of open educational practice. As partner, the school was present for all managerial tasks and decisions (WP9).

**Participants:** Tomáš Komrska, Radomíra Václavíková, Iva Schmittová and primary and secondary teachers.

## 5. Plans for the Future

### P1 University of Barcelona

- The research group ESBINA: <http://esbrina.eu>, of the University of Barcelona has started several plans for the sustainability of the project's outcomes.
- At teaching level, it will go on: a) implementing the DIYLabs through innovative teaching projects such as: The DIY culture at the University. Technological and pedagogical implications to foster independent learning and formative assessment (DIYUni). 2014PID-UB / 075; b) providing professional development courses for higher education and primary and secondary school staff, certified by Institute of Educational Sciences of the University of Barcelona.
- At research level, currently there are in process: a) A partly funded research project: The DIY (do it yourself) culture at the University. Research on learning evidences related to students visual and digital competences, creativity, collaboration and self-reflection from the generation of digital visual objects within a process of formative assessment. *REDICE16-16010*; b) Three PhD research projects are based on DIYLab; c) DIYLab has been implemented in EINA, a non-partner university.
- It will go on disseminating and exploiting DIYLab results in: 1) the Learning City Symposium, at the Core Science Central Newcastle University; 2) and the American Educational Research Association -AERA 2017 annual meeting.

### P2 Oulu University

- Regarding the partners from Finland, their plans for future are:
  - According the new school curriculum we must have at least one multilateral project every year in all the classes in Finland. Two teachers are going to use DIY-lab philosophy as the method during this spring (May 2017). Also, teacher students in their classes are going to get involved and to be informed about DIYLab.
  - We envision a bright future for DIY philosophy in University of Oulu through the initiative: Future Factory. In 2016 we carried out three-day long workshop for new students in University of Oulu. It was mainly based on same philosophy than DIYLab EU project: self-regulation, ICT skills, curiosity, collaboration etc. Without DIYLab project there wasn't be so innovative three days in University of Oulu than they were. We wouldn't ever have reached so deep trust in students without DIYLab. And the future is clear: University of Oulu will organize Future Factory again, even bigger and a bit longer. There will be about 2000 students participating and the challenges they will solve will base on their own disciplines.

### P3 Charles University

- It will go on disseminating and exploiting DIYLab results:
  - IFIP Conference 2017 in Dublin: Černochová, M., Jeřábek, T., Vaňková, P. DIYLab as a way how student teachers can understand a learning process (paper)
  - At the Faculty of Education, the Dept. of IT and Technical Education the DIYLab has been, is and will be integrated as a teaching approach in courses of the Bc. degree study program of "Information and Communication Technology"
  - At the Faculty of Education, the Dept. of IT and Technical Education integrates DIYLab as a theme for compulsory subjects "ICT Pedagogy 01", "ICT Pedagogy 02" and "ICT

- Pedagogy 04” for full-time and part-time MA degree study program of “Information and Communication Education”.
- In 2018-20 the Faculty of Education will co-ordinate a project “Pupils’ Digital Literacy Development”, funded by the Ministry of Education which will carry out the Governmental Strategy for Digital Education. All nine faculties of education in the Czech Republic co-ordinated by the Faculty of Education in Prague will implement a concept of digital literacy cross all subjects in school curriculum for pre-school, primary and secondary education, into initial teacher education and into courses of teacher professional development. The DIYLab philosophy how to develop digital literacy will be a part of teaching approaches in these initiatives. Experiences gained in EU project DIYLab will be exploited in the project “Pupils’ Digital Literacy Development”.

#### **P4: Escola Virola**

The DIYLab project in Virolai School has begun to settle in the educational community and the DIY culture has become part of our educational approach: "a school to learn, a school that learns". That has led us to rethink our teaching roles to foster students learning through a relevant and meaningful autonomy and a collective creativity, approaching real situations in a transdisciplinary and collaborative manner, taking into account skills and knowledge of all participants. This has promoted the implementation of curricular, methodological and organizational changes, especially in the assessment system, basing all it on the individual and shared reflection on the process of learning what, how, when, where, why, with who and for what. The aim is leading students to be aware of their learning and of how to regulate it to be able to learn throughout life.

#### **Further Synergies and Collaboration among partners**

- Oulu Teacher Training School has started the Erasmus+ project *Better Teaching, Better Learning* (2016-2018), and has invited two teachers from University of Barcelona involved in DIYLab project for reviewing and assess it.
- There is a Spanish Monographic Journal (*Cuadernos de Pedagogía*) planned to be published during 2017 about DIYLab project with contributions about the project from all partners.
- There will be a Special Monothematic Issue “Education Futures for the Digital Age: theory and practice” of the journal of *Pedagogika* published in 2018 in Prague in the English language (Editors: M. Černochová, C. Redman, G- Kirkham). The partners from Oulu and Barcelona are welcome to contribute into this Issue.

## 6. Contribution to EU policies

- This Multilateral project addressed the priority for actions under the Key Activity 3: 3.1.1 Reinforcing key competences, such as digital competence, bridging the worlds of education and work.
- In 2006, the European Commission (EC) defined eight key competences – understood as a combination of knowledge, skills and attitudes – necessary for personal fulfilment, active citizenship, social cohesion and employability in a knowledge society [<http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=OJ:L:2006:394:0010:0018:en:PDF>]. One of them is digital competence. The EC recommendation suggests that: “Digital competence involves the confident and critical use of Information Society Technology (IST) for work, leisure and communication. It is underpinned by basic skills in ICT: the use of computers to retrieve, assess, store, produce, present and exchange information, and to communicate and participate in collaborative networks via the Internet.” (EC 2007: 7).
- European policies have taken several approaches to digital competence. The policy approaches emphasize different perspectives and often have elaborated their own specific concepts and definitions to highlight the desired aspects. DG Information Society and Media (INFOS) emphasizes inclusion in the digital society, DG Enterprise and Industry (ENTR) promotes ICT skills as necessary for innovation and industry, DG Education and Culture (EAC) highlights digital competence as a key to lifelong learning, and DG Employment, Social Affairs and Inclusion (EMPL) recognizes digital competence among the necessary skills for new jobs. (<ftp.jrc.es/pub/EURdoc/JRC73694.pdf>).
- Due to the difficulty of implementing competence-based curricula in an educational tradition grounded in subject-based curricula, there is a pressing need to better understand and support the learning of digital competence equally in formal, informal and non-formal learning. Linking the three kinds of learning experiences, as done in DIYLab project, is paramount to contributing to a lifelong and life-wide learning and skills policy.

## 7. References

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