D. 1.6. **Report on Digital Competence in Schools: Spain, Finland and the Czech Republic**

DIYLAB

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Authors:

P1. University of Barcelona. Juana M. Sancho, Fernando Hernández, Cristina Alonso, Joan-Anton Sánchez, Rachel Fendler, Maria Domingo, Raquel Miño, Judith Arrazola, Xavier Giró Gràcia, Anna Majó and Àngels Armengol.

P2. University of Oulu/ Oulu University Teacher Training School. Antti Peltonen, Mikko Ojala, Paula Airaksinen, Esa Niemi , Kari Kumpulainen, Kerttuli Saajoranta, Seija Blomberg, Pasi Hieta and Terhi Ylöniemi.

P3 and P5. Charles University/ ZŠ Korunovační (KORUNKA). Miroslava Černochová, Tomás Jeřábek, Irena Fialová and Tomás Komrska.

P4. Escola Virolai. Coral Regi and M.José Miranda.

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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, p. 7)

1. Background

The DIYLab project seeks to explore the changes (and its educational effects) occurring in the last decade regarding digital competencies, specially in relation to the emergence of a culture of collaboration, that connects youth learning, technology and DIY (Kafai & Peppler, 2011). Young people's efforts to create and disseminate digital media have been associated with the growing do-it-yourself (DIY) movement (Spencer, 2005). Starting in the '90s (McKay, 1998) with arts, crafts, and new technologies (Eisenberg & Buechley, 2008; Knobel, M. & Lankshear, C.), it is now prevalent in curriculum contents (Guzzetti, Elliott, & Welsch, 2010), giving educators and students the opportunity to create, share and learn in collaboration.

We also aim to deeply and sustainably transform teaching and learning practice in the primary and secondary schools and the higher education institutions involved in the project, as well as provide scalability guidelines to foster the development of key competences. In this respect, we find that recent research in educational change (Hargreaves & Shirley, 2009; Sancho & Alonso, 2012) tells us that this can be achieved only by involving teachers and students in the decision process and anchoring new practices in the most promising aspects of teachers' professional knowledge. If teachers and students feel their current knowledge and skills are dismissed instead of built upon—as so often happens—they will revert to their old practices and forget the new skills and resources they have acquired once the project is over.

The main aim of WP1, therefore, was to identify what participant institutions recognize as best practices in developing key competences, and especially digital competence, taking into account the purposeful learning experiences the educational institutions implement to foster lifelong and life-wide learning skills. 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.

2. Participating schools and higher education institutions

The consortium participated in indentifying local knowledge and practices that will become the foundation for designing the DIYLabs that will be implemented in all participating schools and university faculties. The following is a brief description of the participating institutions.

2.1 Spain

Primary and secondary. Escola Virolai of Barcelona is located in the district of Horta-Guinardó. It has two classes each of Primary, Secondary and Vocational Education. In the 2010-2011 academic year, the school had over 912 students. Escola Virolai is an "escuela concertada", 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. It joined Project Educat, an initiative promoted by the Generalitat de Catalunya to provide personal laptops for all students, since it began in 2009. The real strength of this measure has been the methodological changes that the introduction of ICT has wrought. The school strives to reduce the number of lecture classes and aims to help students design their own PLEs. In the academic year 2013-14, the school will introduce a new initiative to provide students with tablets.

Equipment

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 define 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:

1. 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.

2. Review the sequencing of digital competence, incorporating it transversely into course schedules, defining the assessment strategies used to ensure consistency both in course, class years, and whole school levels.

3. Prioritize the use of LKT Technology as a tool to improve individual attention to all students and increase their role in learning.

The school participates in the following projects/initiatives: Educat2.0; DIM UAB; TRAMS 3 (http://www.edu3.cat/Edu3tv/Fitxa?p_id=57687)

The school uses the following digital tools:

- Communication and learning platforms.

- Web.

- Intranet: clickedu.

- Virtual Corner and Virtual Classroom.

- Blogs.

- Digital newsletters - Social networking services and others.

- Facebook: The school has Facebook profile and maintains Virolai groups that bring together alumni.

- Twitter: The school has a twitter profile with followers but it does not follow any user.

- Instagram: The school has a twitter profile with followers but it does not follow any user.

- Mail Groups.

- Weekly Announcements to families and educators. Each week the school sends a newsletter to families and another to educators.

- TicInOut: The school is designing a platform improve the communication with and the involvement of families.

Software and hardware:

- They have started using free software. The computers of Projecte 2.0 come with software. Teachers have access to common computers networked and with printers in the offices and the teachers' meeting rooms.

- All classrooms and teaching spaces are Internet-connected and teachers can use computers and video-projectors.

- The library has a computer that teachers can use. The upper primary education classrooms:

- They all have a video projector and one portable digital whiteboard to be shared with several classrooms.

- Students use the scheduled computer lab and there is a carriage with 25 laptops they can use.

- They all have several tablets · Students can print occasionally in the computer lab. 7 Secondary compulsory education classrooms.

- They all have a video projector and one portable digital whiteboard to be shared with several classrooms.

- All students have laptops.

- Students can print occasionally in the computer lab.

- There is a computer lab with 18 computers.

Teacher professional development

- All staff have an email account.

- Email is the main means of communication in the school.

- All staff uses ICT as a teaching and administrative management tool.

- 100% of teachers using ICT in the classroom and keeping the virtual corner and the virtual classroom up to date.

- At secondary education digital books are used in 80% of the subjects.

- 60% of teachers prepare ICT resources for students.

- 100% of the staff has achieved standard computing skills; and 60% uses computing resources at a higher level.

- Every year a personalized improvement and professional development for teachers is developed.

- Teachers have access to resource banks, organized and sequenced.

Digital teaching resources:

E-books in secondary compulsory education, Mathematics, Ximi and Technology 12-18, Geogebra, Claroread; Google Drive, Portfolios xtec, Blogster, Glogster, Minmaps, Wordle, QR, Educational or Multimedia Platforms.

2.2 Finland

Oulu University Teacher Training School is a versatile school which has two principal roles: apart from being both a comprehensive school and a high school, it also works as a part of the teacher training programme at Oulu University. Oulu University Teacher Training School provides public comprehensive education for 6 – 16 year-old pupils and high school education for 16 – 19 year-old students.

Oulu University Teacher Training School is a UNESCO school where internationality, equality and tolerance are promoted. It provides high-class education also with the aid of the latest information technology.

Equipment

Though the schools are teacher training schools, their standing in room arrangement and in ICT are quite typical, compared to any Finnish school. One can find several newer schools but the schools in our project are well up-to-date in action and in equipment. In general, Finnish schools are just now updating their ICT equipment and the trend is from computer classrooms and desktop PCs to laptops and tablets on mobile carts. This transition phase generates differences between schools both technically and pedagogically speaking.

Status of ICT equipment in Koskela-primary school:

- Four permanently installed computers in computer class for the pupils.

- Sixteen Mac-computers on movable cart.

- Eighty iPad mini-tablets.

- Eighteen classes have a smart board, the computer for control and a document camera.

- The teachers has iPads for personal use.

Status of ICT equipment in Linnanmaa-secondary school:

- Fifty permanently installed computers shared to three computer classes.

- Two classes with six computers.

- Thirty two iPad Mini-tablets on on movable cart.

- Every class has a class computer, a document camera and a data-projector, twenty of them have a smart board.

2.3 The Czech Republic

ZŠ Korunovační is both a primary and secondary school. It educates pupils in Year 1 – 9 (ISCED 1 and ISCED 2), with students aged 6 to 15/16 and is divided into 16 classes. There are currently about 280 pupils attending. The school ZŠ Korunovační has up-to-date facilities including a kitchenette, artist's workroom, sauna and gymnasium. A computer lab was equipped in 2007 with 25 PCs with LCD monitors, Internet and data-projector. To provide an individual approach to pupils, a room of extended care for pupils with special learning disabilities was also established.

Education at this school is based on a philosophy of creativity and on principles related to a creative approach to learning, which are reflected not only in the everyday work

with pupils, but also within the general climate in the school. The school participated in a process that fostered the establishment of a community of "Creative Schools" within the Czech Republic, and has been implementing, step-by-step, the principles of learning by doing, based on a pedagogical model founded by J. A. Komensky. The school applies the following fundamental principles (ŠVP ZV 3in, 2007, p. 7) in such way:

- Aim to evoke pupil's interests both illustratively and through inference.

- Foster pupil's autonomy (support for independent work, while at the same time individualized learning is balanced by collective education); pupils apply their own experience and knowledge, the school opens up a space for pupils to draw on their own ideas and interests.

- Provide a choice of appropriate textbooks, workbooks, didactical and methodical tools and aids so that these meet ways of pupil's thinking and support them in further creative endeavours.

ZŠ Korunovační is a teaching school associated with the Faculty of Education at Charles University in Prague and it has collaborated for a long time primarily with the Department of Art Education and the Department of IT and Technical Education (DITTE) of the Faculty of Education. Recently, the school has enabled ICT student teachers from DITTE to visit the school and to share with teachers their innovative teaching projects and ideas about how to direct ICT teaching. One result of this collaboration was, in 2012/13 it managed to implement into Computer Science in Year 5 the basis of programming using Scratch. The student teachers trained teachers from ZŠ Korunovační who have taught programming together with student teachers in a computer lab (Williams & Černochová, 2013). Not only Computer Science teachers, but also those from Art, Czech Language and English were involved in teaching stories by programming in Scratch. It is expected the DIYLab project will be a follow-up to this model of collaboration between student ICT teachers (students of the Faculty of Education) and teachers from ZŠ Korunovační.

3. Methodology

This report is based, first, on the analysis of the official documents that prescribe the primary and secondary education curricula and the syllabi of the participating schools, particularly in relation to the target years (the 5th year of primary education and the 3rd year of secondary compulsory education). This information was then corroborated with the data collected in a series of focus groups carried out with students, teachers and families in each local context.

Using focus groups allowed the consortium to initiate 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 other, 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 and Bradbury, 2001: 1)

By carefully designing the formation period (WP2) and the implementation phase (WP4) around local practices we hope to develop a more sustainable project that takes hold in the schools and continues beyond the life of the project.

3.1 Curriculum analyses

The national curricula and primary and secondary school syllabi and the selected undergraduate study programs for each country were analysed to identify if, or how, they include digital competence and support its development.

Over all, 13 documents were analysed (see: Annex 1):

- National curricula: from Spain (2 primary and 2 secondary), Finland (1 – comprehensive for both primary and secondary school) and the Czech Republic (2 primary and 2 secondary). In the case of Finland, because the country is currently reforming the national curriculum we decided within DIYLab consortium to review draft of the new curriculum, acting on our belief that even though it is unfinished, it is better for the project and for the schools to orient towards the future.

- Local syllabi: from Spain (3) and the Czech Republic (2). We did not analyse the local syllabus in Finland because it is tied to the upcoming national curriculum reform, a process that is still under development.

The documents were analysed in order to understand the extent to which national and local educational policy could foster DIY learning in schools. Based on these analyses the consortium has developed an in-depth understanding of how each school context can support the implementation of the DIYLabs, and we have identified where possible tensions may arise.

3.2 Focus groups

Focus groups were carried out in each country. Each school organized the groups by inviting teachers, parents and students to participate and by coordinating the timing. During the sessions, both school and university partners collaborated in guiding the discussions. The setting was open and informal and opinions were genuine.

	Teachers	Parents	Students	Country
Primary & Secondary	5 Primary 6 Lower Secondary	6 Primary 6 Lower Secondary	6 Primary 6 Lower Secondary	**Spain**
	8 Combined	10 Combined	8 Combined	**Finland**
	8 Primary 7 Lower Secondary	5 Primary 6 Lower Secondary	10 Primary 6 Lower Secondary	**Czech Republic**
Higher Education	6 from 5 departments	-NA-	5 from 3 degrees	**Spain**
	/.../	-NA-	Master students 9 full-time 11 part-time (last term) 8 part-time (first term)	**Czech Republic**
Total	**40**	**33**	**69**	

Table 1. Number of participants in focus groups, by country and education level

The main ideas of the DIYLab project were presented at the beginning of the meeting, dedicating time to discuss the notion of "do-it-yourself" and its relationship to learning. This introduction was followed by comments and discussion. Questions were posed that were open-ended and designed to allow participants to share anecdotes and their personal opinions.

Questions for parents:

- In what contexts do you believe that the school teaches or allows children this type of learning [i.e., DIY learning, previously explained]? How does it do this, and what tools are used in the process?

- Where else do your children develop similar learning practices? How? With what tools? With who?

Questions for teachers:

- When do you think the school teaches or allows this kind of learning [i.e., DIY learning, previously explained]? How does it do this, and what tools are used in the process?

- Where else do you believe students are developing these skills? How? And with who?

- How do you think the school could improve in its manner of supporting this type of learning?

Questions for students:

> - When do you think the school teaches or allows you this kind of learning [i.e., DIY learning, previously explained]? How does it do this, and what tools are used in the process?

> - Where else do you develop these learning practices? How? With what tools? With who?

Audio recordings of the discussions were made and the results were transcribed. Afterwards, consortium members summarised the main outcomes of the local focus groups in English, based on the commentary found to be most relevant for furthering the development of this project. These English-language summaries have been used for compiling the final report.

3.3 Meta-analysis and recommendations

After analysing the curricula and local syllabi and carrying out the focus groups, the analysis of the data will be two-fold. On one hand, the in-depth knowledge we have gathered from the first phase of the project will allow us to identify the needs of each institution prior to implementing the DIYLab. This report serves, therefore, as a guide for the upcoming formation (WP2) and implementation (WP4) phases of the project.

On the other hand, the data provides a glimpse into what DIY learning could look like in European schools, where digital competence is considered a key competence at all educational levels. Therefore, based on our analysis, we will also discuss in which ways DIY learning supports and interacts with current European initiatives for fostering digital competence among students.

The following sections address this meta-analysis in greater detail.

4. Digital competence and DIY learning: a review of national curricula and local syllabi

This section summarizes the findings from the curriculum analyses carried out in the three participating countries (see Annex 1) and provides an overview of the tensions and points of contact that emerge when looking at how DIY learning relates to the notion of digital competence.

Specifically the document analysis was based on the following key points that relate to basic principles of DIY learning:

> 1. Autonomous and self-regulated learning

> 2. Inquiry-based teaching and learning

3. Transdisciplinary or interdisciplinary knowledge, links and connections

4. Digital competence

5. Collaborative learning

6. Opportunities and limitations for anchoring the DIYLab program to the curriculum

4.1 The Spanish context

Based on their analysis of national curricula and local syllabi, researchers defined official initiatives that are in line with the main aims of the DIYLab project. The following four key points identify key areas that the project will address while moving forward:

Autonomous and self-regulated learning. The term autonomy, referring to the students, appears repeatedly in several pages of the national documents and receives special emphasis in the learning to learn competence. The school curriculum also includes this aspect, but to a lesser extent.

Interdisciplinary knowledge. An aspect of this vision of knowledge can be connected to the notion of "functionality of learning (application of knowled¬ge in different situations and contexts)" (Department of Education, 2010a: 152; 2010b: 242), although the notion of interdisciplinarity itself is not present. Meanwhile, the school syllabi are expressed in terms of discipline-based subjects and therefore there is very little reflection of an interdisciplinary aspect of knowledge within these documents. A tension emerges here between national policy and the day-to-day life of the school that needs to be attended to in order to reduce conflict.

Inquiry-based teaching and learning. In the case of secondary compulsory education "the resolution of problems of everyday life" (Department of Education, 2010b: 6) is considered a fundamental objective of this educational stage. While one of the educational aims that primary school education seeks is to: "apply, in diverse contexts, the different forms of knowledge acquired and use one's own resources, in order to solve problems, personal situations and meet the needs of everyday life creatively" (Department of Education, 2010a: 13). In each document we determine that the curricula supports problem-based learning that connects with pupil's lives.

Digital competence. According to the Department of Education the information handling and digital competence involves "developing working methodologies that help the students in becoming autonomous, efficient, responsible, critical and reflexive people in the selection, treatment and use of the information and its sources, in different digital supports and technologies. Critical and reflexive attitudes must also be strengthened in the evaluation of the information available, checking it when necessary, and respecting the rules of behaviour socially agreed on in order to regulate the use of the information" (Department of Education, 2010b, p. 26). Emphasising aspects such as: instruments and applications; information handling and organisation of the work and learning environments; interpersonal communication and collaboration; citizenship,

habits, civic behaviour and digital identity (Department of Education, 2013a: 7; Department of Education, 2013b: 9). Therefore according to Spanish national curricula, digital competence does not refer to technical skill, but general (and critical) literacy across a range of media use. The school also considers it a transversal competence, which supports the project aims at implementing a DIYLab that is designed to be transdisciplinary across the school system.

4.2 The Finnish context

The first-draft of the 2016 Finnish national curriculum emphasizes the importance of key competence development: "The new core curricula build on key competence development (KCD), an approach that can be seen in many areas of the curricula. The approach to KCD is holistic and should occur through the study of individual subjects." Because key competencies are transversal, this opens up space for imagining the role of the DIYLabs. Of the 8 competencies listed, Finnish researchers identify two as having particular relevance for the project: Multiliteracy and ICT.

At the primary school level (years 3-6), multiliteracy refers mainly to students' capacity to increasingly source, interpret and produce texts in different formats, managing and reporting on information and becoming active readers. The ITC competence refers to more technical skills, stating the need for students to become familiar with and proficient in the operational logic of different media and platforms.

At the secondary level (years 7-9), multiliteracy skills are deepened and developed further with the aim of encouraging students to engage with the material, to improve communication and to produce information across different formats. At this level, ICT competence begins to bridge students' school-life with the professional world, supporting autonomous learning and inviting skills learned from outside school into the classroom Students are asked to understand the role of ICT in society and practice transversal use of ICT across different subject matter.

Regarding the analysis of the curriculum based on the 6 focal points cited earlier, researchers have carried out a transversal reading by applying them to the 8 main sections of the draft version of the curriculum (see, Annex 2):

1. The drawing up and the importance of the local curriculum

2. Basic education as the basis of general education

3. The mission and goals of basic education

4. A uniform basic education culture

5. Learning and promoting the welfare of the organization of schoolwork

6. The evaluation of learning

7. Learning and school support

8. Language and cultural groups – bilingual teaching

The conclusions from this analysis is that as the curriculum is remade to suit the needs of future students, it appears to adopt a number of shared values also expressed within the DIYLab project such as: promoting a learner-centred discourse, developing a flexible balance between the individual student and the learning community, and a transversal application of a range of skills, including digital competence. We believe that this new curriculum, in its current state, is mostly compatible with project aims and that we will be able to justify the presence of the DIYLabs within this new educational framework.

4.3 The Czech context

Unlike the Finnish context or even the Spanish context, within the Czech curricula there is little to no national incentive that promotes the main educational aims established in the DIYLab project. For example, there is no mention of autonomous learning or collaborative learning, and very little mention of inquiry-based practices. Of the six key competences listed by the national curriculum (competency for learning; competency for problem solving; communication competency; social and personal competency; civic competency; and labour competency), digital competency does not appear and is not given transversal status in educational policy. Instead, it appears in the educational domain in terms of subject matter within two specific courses.

The Czech researchers conclude that the national curricula places emphasis mainly on a pupil's learning and his/her individual development, and not on learning as a process within social interaction (for example in communities, in teamwork, etc.) based on principles of inherent collaboration that are common and prevalent for on-line communities of learners through technologies Web 2.0. Great attention is paid to cognitive processes, and acquiring special knowledge from different branches and subject matter.

More flexibility appears within the "cross-curricular topics", namely Media Education, as well as Environmental Education and Personality and Social Education, which tend to focus on projects and teamwork unlike other courses mentioned.

However, whereas the national curricula appears distant from the philosophy of DIY learning, a great deal more affinity emerges at the local level, where the particular culture of the Czech school, a so-called "creative school," is more closely aligned with the principles of this project. In the school curriculum there are six compulsory cross-curricular topics which are organised in collaboration by teachers of various school subjects. Through these cross-curricular topics, the school pursues many important activities which correspond with the idea and purposes of DYILab. On the primary education level the cross-curricular topics require pupils to apply studied content in their own everyday activities and they have opportunity in each topic to speak about their experiences gained in cross-curricular activity and attention is given the discovery of relations and connections between subjects, branches, school education and a pupil's life. (See Annex 3 for more detail).

4.4 Conclusions

When brought together, the analyses of Spanish, Finnish and Czech curricula reveal three different contexts. The Finnish 2016 curriculum demonstrates more affinity with the aims of DIYLab, with more emphasis on transversal approaches to competences and a comprehensive, two-pronged consideration of digital competence (as mulitliteracy and ICT skills), however this unimplemented reform sheds little light on what these official policies look like in practice. The Czech context, on the other hand, serves as a reminder that the local school context has a great deal of influence over how the curriculum is introduced and put into practice. Where the Czech national curriculum does not share the lexicon and principles of DIY learning, the school itself does and through local initiatives it has implemented measures that can support the project. The Spanish context also reveals a highly motivated school, although the national curricula do support specific DIY principles such as autonomous learning, among others, providing additional support and incentive to the school.

The analyses also reveal that in each context, albeit to different degrees, digital competence today is of great importance in each education system. All three contexts ("Media Education" in the Czech Republic; "Multiliteracy" and "ICT competence" in Finland; "Information handling and digital competence" in Spain) recognize the importance of providing both technical instruction to pupils as well as a transversal space for the complex development and application of these skills. Our project recognizes and supports these issues. By introducing DIYLabs in each school, the project does not challenge current policy but rather attempts to develop an effective and sustainable way to support it through the innovative development of transversal, dynamic and collaborative sites of DIY learning.

5. Local knowledge of DIY learning: teachers, parents and students

Before looking in-depth at the challenges raised by this project as well as the recommendations we can make based on the data gathered in this initial phase, we will review the results of the focus groups.

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:

- Parents are in touch with what students are doing but tend to reflect on the current situation by drawing on memories from their own school days, and the concepts were often from past decades.

- Teachers tend to think about their future plans and hopes, more than the situation at hand.

- In student groups discussions about actual school life was quite well reflected. However, comments by the young people may unintentionally reflect the wishes of the teachers and parents.

One notable observation was that all three groups tend to see school life and life outside the school (free time, at home) as fairly separate domains. Cooperation exists and it is appreciated but somehow the time-honoured concept of a school is influencing on the background more strongly than we expected: the traditional school building, timetable, subjects, etc. all construct such a strong framework and outlook of the school life, that it was even hard to imagine how things could be done differently.

5.1 Teachers

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

In the Spanish Higher Education context, faculty members were supportive because they felt that in general, students are more motivated when they undertake this type of activity (project). Moreover, this motivation particularly increases when the students can apply or implement an idea, an approach, a product... taking on an active role.

In the Czech context the teachers commented that they felt that continually called upon to do things for others. In addition to feeling over-burdened, they are disappointed that the school will not receive any technological equipment from the DIYLab project, they consider it very important to be able to use digital technology while teaching.

5.2 Parents

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. Also, both in Finland and the Czech Republic, parents also cited more recent technologies acquired by the school that support DIY learning, like iPads, but particularly within the Czech context it never appeared to be enough, the need for more access was a concern.

The primary school families in Spain introduced the question of cultural difference; they think that there are contexts more directed towards this philosophy than others. 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 on what to know, but on how, where, for what and why.

5.3 Students

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.

Regarding the role of DIY within school, students were sceptical that it would be possible to really *do-it-yourself* in such a setting. They recognize that teachers typically give students direction, and that a high number of students aren't driven or self-motivated enough to continue alone.

Digital access is somewhat limited although it appeared almost as if, while all the pupils did not have the latest ICT-tools, typically within the pupils' circle of acquaintances somebody usually has both the necessary devices and the know-how. Therefore a collective camaraderie often circulated among friends, and tools and knowledge about how to use them are shared.

5.4 Conclusions

Based on the conversations developed in the focus groups, we have identified 5 issues that dominated the discussions across all three countries.

The idea that children are 'digital natives' is still a pervasive discourse. Parents remark on the ease with which the young people use technologies to create interactive content and compare that with what they did as young people. This is both considered as positive in the sense that young people are seen as possessing the skills to succeed, but also there is an acknowledgment of a loss of other skills, which are no longer put to use.

> "Using new technologies, 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's new skills are not seen as worse, but they are understood as being essentially different than analogical skill sets. We believe that questioning this perceived difference could be a productive exercise for thinking about creative learning or autonomous learning as not necessarily dependent on the use of digital technology.

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. This understanding was expressed by parents, students and teachers alike.

The idea of autonomous learning was familiar to all discussion 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" we see that it is not considered to be exactly the same thing. DIY implies more freedom and choice, and less structure.

We note during the focus group discussions that there was little mention of the collaborative, "give back to the community" type of ethos that is prominent in the DIY movement. Differentiating between the idea of having total autonomy in your learning and the concept of becoming an active and equal citizen within a learning community may be a productive starting point when designing the DIYLabs.

Connectivity is a way of living and learning. Conversations on this topic bridge the distance between in and outside school. Families comment 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… A bunch of things… they spend all day sharing."

Illustrating what is referred to as life-wide learning (Banks, Au, et al, 2007), teachers mention that their students learn from teachers, their peers and their families.

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

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 discuss whether young people should be learning the same things, the same way, and if not, how can they be assessed?

The focus groups talk about what it means to have a "solid 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 resolve problems, organized in order 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.

Teaching and autonomous learning. Putting the DIY philosophy into practice involves a series of predispositions and challenges. Teachers from secondary schools and faculty members in Higher Education raised doubts and were ambivalent about the degree of autonomy that the pupils had to develop in the project.

This situation gives rise to three questions in relation to DIYLab:

- What is the role of the teachers when promoting the autonomous learning of the pupils?

- How do we go from the challenges set by the teachers to the individual challenges of each pupil (and vice versa)?

- How should assessment be carried out?

While doubts about what teaching in a DIYLab could mean were common, teachers also recognized that the model potentially could "free up" their time and allow them to distribute their attention based on who in the classroom was more needy. Finally, students in Finland commented that DIY-type lessons occur more often when student teachers are not present, implying that it takes a degree of expertise to be able to manage a classroom this way.

6. Introducing DIYLabs into participating schools and educational contexts

A review of the local syllabi, in addition to providing insight into the role of digital competence in each context, also shed light on possible areas in each school that would be more conducive to the project's aims and objectives. The following is a brief summary of the comments participants in the focus groups made about where they believed was the best fit for the DIYLabs.

6.1 The Spanish context

<u>Primary and secondary education</u>

Students and families are able to identify areas within school where DIY learning takes place:

> - In the Technology subject where they are creating apps. "If you take away the part of 'do these 5 activities' and we go directly to 'I want you to design the application you most like and totally free...', it's great."

> - In the synthesis project. "They make you work on a subject... but from that subject you can do what you like most..." Even though they point out discrepancies between what they think and what they have done and learnt and the mark they get.

> - In the Enterprise project.

> - In the Sciences project. They refer to the participation in the Lego League.

> - Open day.

> - The Midday Workshops.

> - The Oratory Workshop.

> - Decorate the Door competition.

The primary school teachers said they consider the pupils as the focus of the learning, and they point out situations that promote this viewpoint:

> - The area of Environmental knowledge, where the pupils do more or less interdisciplinary research projects.

- The tutoring sessions, where they attempt to do an activity with which they can show their potential to do research on their own.

- The Learning-Service, where the 5th and 6th year pupils help promote reading in the 2nd year class.

They also say they place special emphasis on promoting meaningful learning and set it as a challenge. The pupils from this stage, in line with what the teachers say, are guided to take into account what they learn outside school. Their families believe that the school encourages learning, and they point out some things learnt by their children that they find surprising for the maturity they demonstrate.

Digital competence

From the point of view of the secondary school teachers the school has made a clear and firm decision to use learning and knowledge technologies (LKT) to favour learning experiences and the development of digital competence. During the session they mention the following applications: *Dipity,* to create time lines, *Mind Mapping¸ Bloggster, Arduino, Googlesites, Edmodo, Symbaloo; eportfolis;* flipped classroom; *Mydocumenta, Eduloc; Google Apps* (now *GoogleDrive*). Moreover, they have experience in creating video games and using blogs.

The secondary school pupils point out a series of contexts as a substantial part of their learning process, some of which are accessible in and outside school:

- Video tutorials.

- Television.

- School exchanges.

- "YouTube teaches quite a lot"

- "Normally, if you look for something, on YouTube it will always be there... there is always some tutorial".

- Yahoo Answers.

- Books.

The pupils in this stage are regular users of digital technologies and stated that they are comfortable with them. Regarding the use of these digital technologies in school they referred to:

- The virtual classroom.

- Mathematics and reading webs.

- Did you know? – doing research from a question.

- Mydocumenta, "a programme for making digital posters and hanging them."

Higher education

According to the faculty members, the curricular and subject spaces where it would make sense to implement the DIYLab project would be:

- "Practices of involvement" of the Pedagogy degree.

- "External practices II" of the Social Education degree.

- "End of Degree Projects" (EDP).

- "History of Education" of the Pedagogy degree.

University students conferred that there are subjects where it would make sense to implement the DIYLab project. They listed:

- "Design, development and innovation of the curriculum", of the Pedagogy degree.

- "Axiology of values" from the Pedagogy degree where the teachers proposed they take part in Learning Service (ApS).

- "Social and educational policies" from Social Education and some subjects related to ICT.

- "Research and Evaluation" from Social Education.

- "Research and Innovation" from Primary School Teacher.

- End of Degree Projects (EDP).

In addition to these courses, the students point out some digital environments used in the degree, which they think would support the development of a DIY project. They mention a type of platform where students can accumulate everything that interests them, as students or as future educators. Specifically, these applications were named: *Prezi*, *Symbaloo* and *Diigo*. They emphasise *Symbaloo*, which as well as organising links and content, also allows users to share them with other people. Therefore, not only can students organise themselves but they can also see what others are doing.

Finally, when discussing the best way to integrate the DIYLab into the Faculty of Education, students mentioned that a practice was already in place that allowed people to share the knowledge built up with the other colleagues, a question that is increasingly attracting more interest among researchers (Falchikov and Goldfinch, 2000; Strijbos, Ochoa, Sluijsmans, Segers and Tillema, 2009; Kollar and Fischer, 2010; Gielen, Dochy and Onghena, 2011).

Regarding challenges that have been identified:

- Faculty members worry about the difficulties (for faculty members) in achieving proficiency with digital platforms, highlighting that there is a difference between them and students;

- On the other hand, the students refer to the difficulties associated with group work.

- Access to the information and class content are also very important to students, and the virtual environment – whether it is Moodle or another – that supports the project needs to be well-organised and provide access to all kinds of information in order to be useful.

- Finally, the faculty questions the degree of autonomy that the students need to develop in the project. They believe they have the capacity for it, but that they often need the help or guidance from the teachers to a greater or lesser extent. There are therefore diverse nuances about how and when the academics should intervene during the time the students are working on the project.

6.2 The Finnish context

Primary school

In Finland, the teachers spoke about specific shortcomings of the school that, if addressed, would greatly improve the project's outcomes:

- The central problem seems to be the traditional classrooms of the school which are echoing and which impede teamwork. The teacher trainees could organize more teamwork etc., if there were separate group premises in use.

- Also, logistically the school needs to resolve issues like where to store DIYLab projects (which will be new), how to source extra material for more hands-on, inquiry-based learning, etc.

Secondary school

Secondary teachers gave a few of examples about successful school projects that reflect DIY aims:

- Efforts have been made to connect home time, personal skills and a school framework, for example while making of the presentation from the vacation trip and in the recording of nature observations.

- 32 Mini iPads will arrive at the school in the fall, which ease a little the situation but the number is still too small to change general teaching practises.

- Previously, one Physics course had a blog where experts (teacher trainees) answered questions. The operation also grew to allow for pupils' answers and communication within the site, and it was used mainly after the school hours.

6.3 The Czech context

Based on current conditions in the school, researchers have identified the following strengths and weaknesses.

Strengths for implementation of DIYLab philosophy:

- The principle of creativity guides the learning at the school, as well as the development of competency to creativity

- Engagement within the community of Creative Schools

- Prior experience regarding how apply ICT into school education (Teacher-training program)

- Collaboration with the Faculty of Education, Charles University in Prague

- Support for interdisciplinary connections and relations

- The school focus on a cultivated and sophisticated pupil's creation and production

- Collaboration with families

- Children may sign up for access to computers in school libraries

Weaknesses of the school

- A certain obstacle for a DIYLab activity is the fact that not all teachers of ZŠ Korunovační are ready to use advance digital technology, like tablets, and that some digital technologies are not common or available in the school.

- In the Czech Republic there is a lack of financial budget for technological equipment in schools. Pupils have better technological equipment than their teachers. Experiences and ICT training are lacking to teachers. There is a critical deficiency in ICT teacher training and ICT sources for teachers.

- There are social gaps among children; not every child has a smartphone or tablet that s/he can use in school. According to teachers, they believe that the school would benefit from having tablets which could be lent to at children home.

- One computer lab is shared by all classes. If a teacher would like to be with his/her pupils in the computer labs/he must negotiate deal with other teachers.

6.4 Conclusions

By reviewing what focus group participants have identified as the key strengths and weaknesses of the schools and higher education contexts, we are able to begin to determine what the best approach may be in each school, when launching the formation and design of the DIYLabs. It becomes clear that the subject-based dimension expressed by the school curricula presents a challenge when considering where to extend more interdisciplinary and integrated projects to foster meaningful learning, curiosity, creativity and learning for understanding. We find that school communities express a lack of physical space for this extra project but also a lack of space in the schedule, as well. This will be a main issue to be addressed in the next phase.

In line with our collaborative action research methodology, we aim to use this data as a point of departure for the next phase of the project. We will disseminate the list

of possible areas in each school that may be receptive to interacting with the DIYLab, as well as try to address the weaknesses expressed in some cases, both in terms of infrastructure and regarding teacher professional development.

7. Conclusions: challenges and recommendations

At this stage, the biggest challenge we face is the task of imagining the new, of trying to develop a model that responds to the needs of each context yet manages to provide a comprehensive and innovative structure. Therefore, the upcoming formation phase will struggle against the tradition of our educational culture that tends to tell teachers what they must do and how they must do it. We challenge ourselves and all project participants to develop a professional atmosphere of learning and cooperation that assists the development of proposals in which the three principles of the DIY philosophy are integrated: creating, sharing and learning in collaboration.

We take comfort in the observation that this project has been well received by participating schools and focus group members, instilling the consortium with the sense that the project responds to what the school community wants. This is, in fact, the greatest strength of the consortium. Working with schools with close ties to research universities (Finland and the Czech Republic) and/or a desire to innovate and develop innovative learning practices provides a strong foundation for the project.

7.1 Implications for the next stages: formation and implementation

We can make some inferences from this report that will be fundamental for the development of the following stage of the project: the professional development of the teachers. We believe that the formation process should correspond to formation models that teachers are familiar with, which may result in differing strategies in different countries. (For example, Finland may develop an online course and Spain may choose to work at Escola Virolai during school hours.)

Common elements of the formation should:

- Be based on the exchange between members of the school and the university;
- Be linked to classroom practice;
- Take into account the personal and professional baggage and interests of all the participants;
- Promote reflection about what DIY learning is, and the philosophy on which the project is based.

By thinking innovatively about how to approach digital competence, the project aims to develop a distributed lab, or central hub, where work takes place in a networked, cloud environment (in and outside school) and experiments with diverse types of technology. In this context, a second challenge, in addition to the professional formation, will entail designing a space for the DIYLabs in each educational context. This will not necessarily be a physical space, but rather a pedagogical one. The space in question must address the reach of the DIYLabs in each school: defining who is supposed to participate, when, how, and so on. (See Section 6 for preliminary suggestions).

Obstacles and challenges according to the key focal points of DIY learning

1. 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.

2. 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.

3. 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.

4. 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.

5. 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.

6. 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.

Table 2. Summary of obstacles and challenges for the formation phase

7.2 DIY in support of digital competence

This proposal entails an opening-up of more traditional educational formats; it encourages a pedagogical shift toward a learner-centred approach. Also, it destabilizes our understanding of curriculum, obliging us to consider whether students have to learn the same things, in the same way, at the same time. By questioning more established models of teaching and learning, we hope that this project approaches those modes of learning which seem to be increasingly widespread yet have little in common with traditional teaching (Collins & Halverson, 2009; Thomas & Brown, 2011).

While charting a new course, there is a risk of getting lost, which this consortium is aware of and will work vigorously against. We understand the fragile border between purposeful and purposeless work, especially during time spent engaged in group work and/or while using new technologies or the Internet. We also recognize the importance of maintaining an open dialogue with local stakeholders and will consider employing a communication strategy modelled on advocacy to ensure that community members have all the relevant and up-to-date information regarding the development of the project.

Ultimately, this report has demonstrated that the basic principles of DIYLab are not alien to the current educational environments where the project will be implemented, but instead closely support and build on the transversal nature of "digital competence", which, as has been discussed, is recognized in the curricula of all participating countries. Therefore, DIYLab is not an entirely new approach but rather, is best understood as a step towards meeting the challenges of 21st century education.

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ANNEX 1 – National curricula and local syllabi

1. National curricula consulted

Spain

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2. School curricula consulted

<u>**Spain**</u>

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<u>**Finland**</u>

Not analysed because the focus was on the upcoming curriculum (2016), the draft of which is only available at the national level.

<u>**Czech Republic**</u>

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ANNEX 1 – Finnish analysis of the connections between DIY learning and the current draft of the 2016 national curriculum

1. Autonomous/ Self-Regulated Learning

The drawing up and the importance of the local curriculum

- The personal schemes of pupils are constructed to be based on the common curriculum (basic education act).

- The student's right to receive education according to the curriculum, student counselling and support to learning.

- Everyone who works with the students has to follow the curriculum the education provider establishes and compliance with the other guiding norms of work.

Basic education is the basis of general education

- The obligation to take care of every child's learning is emphasized the uniqueness of each learner.

- Schoolwork is based on the notion of learning, with a focus on: the learner's work and participation, goal-oriented learning ability; the learner's emotions and experiences meaning; learning and schoolwork significance of the learner; co-operation and interaction of the importance of learning; the importance of encouraging feedback; a variety of learning environments and working practices as learning facilitators; well-being is both the precondition as well as the result of the learning.

The mission and goals of basic education

- Each student's learning, development and welfare is supported.

- Wide-ranging expertise will support the student's identity and the development of a sustainable lifestyle.

A uniform basic education culture

- Learning environments and working procedures will help how the students experience the operating culture, learning environments should support individual and community growth, learning and interaction.

- Students are given the opportunity to influence their own learning environments.

Learning and promote the welfare of the organization of school work

- The organization of school work takes into account the needs, conditions and strengths of all pupils.

- Students will have as a member of the school community their own responsibility.

· Fair and appreciative attitude towards the school, schoolmates and adults

· Obeying the common rules, taking care of agreed duties and responsibilities.

- The law requires the student to participate and perform their duties conscientiously and to behave decently.

- The exemption from participation in education may be granted only temporarily for a special reason.

- Participation of pupils in their own schoolwork and action planning their group is emphasized.

Evaluation of learning

- The student's point of view.

- And encouraging atmosphere that encourages entrepreneurship.

- Pupils inclusive, conversational and interactive approach.

- Supporting student to understand of the own learning process. The visualization of the student's progress throughout the learning process.

- The fairness and ethics of evaluation.

- Versatility.

- The knowledge of teaching and planning other school work exploits the information gained from evaluation.

- Different ways for pupils to learn and work are taken into account. Students should be able to demonstrate their knowledge through appropriate mechanisms.

- Evaluation of a variety of situations and the display cases is taken care of that the pupil has enough time and that the assignment is understood.

Learning and school support

- The student aid received must be flexible, planned and long-term support as needed changing.

- Learning and school support means learning community and environmental solutions, as well as meeting the needs of individual pupils.

- Guidance is aimed at the fact that the student learns to set goals for their learning and takes responsibility for their learning.

- Education takes into account, as well as the group that the individual pupil's needs.

- Enhanced support must be provided quality and quantity of the student's individual needs.

- The learning plan must be drawn up unless there is an obvious obstacle, in collaboration with the student and parent or guardian. Other experts are involved in the preparation as well. The student's share of the planning increases in the transition to higher education classes.

- Special support is to give the student a comprehensive and systematic support so that the student can complete their compulsory education, and gets the base of the continuation of their studies after primary school. The student's self-esteem, motivation to study, and the opportunity to experience the success and joy of learning strengthened. Similarly, the student involvement and ownership are supported.

- Pedagogical solutions may be related to teaching and working methods or elective materials and tools. These range from learning objectives and contents, as well as the student's personal needs. Support of teaching is characterized by a unique design tasks, time management and control. Support the organization of teaching should be used in a wide range of methods and materials that can be used to find new ways of approaching things.

- Part-time special education goal is to strengthen the student's learning conditions and to prevent learning and school problems.

Teaching of the language- and culture groups, bilingual teaching

- Teaching Romani language speaking pupils the age of the students and the Romani language skills are taking into account. The Romani language community and the media are utilized.

- Teaching sign language the sing language community and the media are utilized.

- Bilingual teaching focuses on the natural communication and interaction, functionality, and students' active use of languages.

- Across the curriculum and in teaching language immersion emphasizes clarity and concreteness, a student-centered methods and interactivity.

2. Inquiry Based Teaching And Learning

The mission and goals of basic education

- The continued cooperation possible together with the other countries of schools and teaching developers.

A uniform basic education culture

- Place and time, untied learning is made possible in an appropriate manner; peace at the workplace, as well as a friendly and relaxed atmosphere support learning.

- Differentiation guides the choosing of working practices, is based on knowing the students and is the pedagogical starting point for all kind of teaching.

Learning and promote the welfare of the organization of school work

- Utilizing the remote connections over the education is differentiated and grows more solid.

3. Transdisciplinary Knowledge

The drawing up and the importance of the local curriculum

- In the background: reports and information of the world around the school is changing, and are structured in a sustainable future

- The school curriculum connects school activities with the other municipal activities for children's welfare and learning

Basic education is the basis of general education

- Awareness and internalization of a common set of values

- At home and at school, the value of education is emphasized

The mission and goals of basic education

- A new concept: a wide-ranging know-how

- Aims at cross-curricular skills

- Wide-ranging know-how requirement will rise to changes in the world around, it means the wholeness of knowledge, skills, values, attitudes, functional capacity and the will

- The main objectives of teaching that promote wide-ranging know-how:

· Thinking and learning to learn skills, cultural knowledge, interaction and expression; self care and life skills; multi-literacy; information and communication technological know-how; working life necessary know-how and entrepreneurship; participating in and influencing, and the construction of a sustainable future

A uniform basic education culture

- The goal of defragmenting is to help students to understand the relations between the topics to study, to combine the various disciplines of knowledge and skills and to structure their experience into meaningful wholes interact with others.

- The examination of the entities and linking disciplines, studied projects will help to apply the knowledge and produce successful collaborative knowledge construction.

Learning and promote the welfare of the organization of school work

- Guardian's role is to support their children's responsibility to school.

- The guardian has the primary responsibility for the upbringing of their children. Involvement of parents in is emphasized; building trust, equality and mutual respect are aiming for.

- In-school collaboration and cooperation with other bodies is appreciated, multi-disciplinary cooperation is needed in learning units, morning and afternoon activities, etc.

4. Digital Competence

The mission and goals of basic education

- Wide-ranging know-how will require in variety of networking activity in order to realize. In wide-ranging know-how is to be emphasized: information and communication technological know-how:

- Is general education and essential skills of civil

· Every student should have equal possibilities to learn information and communication technology.

· Learning environments in which students use a wide range of hardware, software, content and services in all grades in different subjects, and multi-disciplinary learning modules, and other school work.

The four main areas:

1. Information and communication technologies, and understand the working principles and key concepts as well as using practical information and communication technology skills to in drawing up their own outputs

2. Information and communication technology –responsible and safe usage

3. Using information and communication technology in order to get information as well as investigative and creative work.

4. Practising to use information and communication technology in interaction and networking

- The pleasure of working together

- Experiences of using information and communication technology in international networking

- Multiliteracy/ understanding of the text to be vocal, visual, kinaesthetic, print, analogue and digital

- Teaching multiliteracy aims at students' communication skills in the development of cross-media, technology in different ways based learning environments

A uniform basic education culture

- New information and communication devices will be introduced in an appropriate manner, and diversely, taken into account in the choice of working practices.

Evaluation of learning

- Information and Communications Technologies and opportunities are taken care of as well as the auxiliary appliances are available.

Learning and school support

- Pedagogical solutions may be related to teaching and working methods or elective materials and tools. These range from learning objectives and contents, as well as the student's personal needs.

Teaching of the language- and culturegroups, bilingual teaching

- The Romani language community and the media are utilized. Sign language community and the media are used in teaching.

5. Collaborative Learning

The drawing up and the importance of the local curriculum

- The local / school, the curriculum will create a common basis and direction for daily school work - it is a strategic and pedagogical tool that lines the work in schools

- The academic year plan specifies how the curriculum is implemented during the school year

- Together with the teaching organizer practical how-to –questions are solved

Basic education is the basis of general education

- Co-operation with homes is valued

- The student's uniqueness and the right to a good education

The mission and goals of basic education

- Will be built at all levels of the students a positive identity as individuals and as learners

- Close co-operation with the parents

- Preventive philosophy - to create the conditions in all activities for good to become possible beforehand

- Change in the needs of an open encounter, critical assessment and take responsibility for choices

A uniform basic education culture

- In the development of space solutions are taken into account ecology, aesthetics, accessibility and acoustic conditions as well as lighting, indoor air quality, comfort, order and cleanliness.

- The choice of working practices promotes collaborative learning.

- Teaching is defragmented a cross-sectoral learning wholes, which promote achievement of the goals and specially large-scale development of know-how.

- Topics are designed to express the local business culture dimensions.

- Each subject teaching and accrossing the subject boundaries look at the real world phenomena or themes entities.

- Deciding local curricula on the content delivery mechanisms that every student's studies includes one multi-disciplinary entity at the least in year,

teaching module is designed so that there is time to become familiar with issues properly. Accomplishment requires co-operation between the subjects that represent different approaches. Teaching modules designed to deal with operational experience for the students belonging to the world and enriching things.

Learning and promote the welfare of the organization of school work

- The starting point is a shared responsibility and care for everyone's good and safe school day.

- Education – and teaching in the school is for all adults, regardless of the task.

- Co-operation takes place on a broad front in order to ensure the unity, integrity and quality, to increase the transparency of the doing.

- The school must be a unity, which consists of it's pupils or more of the schools' students formed a fraternity, whose task is to promote collaboration, empowerment and participation.

- Lessons outside of school club activities: support students' physical, mental, social, and ethical growth and development.

Evaluation of learning

Features of the evaluation culture:

- Encouraging atmosphere that encourages entrepreneurship

- An inclusive, interactive and interactive approach for students

- Supporting the student's own learning process in understanding and the visualization of the student's progress throughout the learning process

- The fairness and ethics of evaluation

- Versatility

- The knowledge of teaching and planning other school work exploits the information gained from evaluation.

- Partnership with families is continuous, guardians are entitled to receive information of the evaluation criteria and their application to the evaluation of the student.

- Evaluation is also a teacher's self-assessment and self-tool for reflecting

- Assessment practices and providing feedback has to be planned and implemented the students 'age and under the conditions, attention is directed to students' strengths and learning progress in relation to the previous technology.

Learning and school support

- Education and support organization based as much on each student's strengths the teaching and learning and development needs.

- Education takes into account, as well as the group as the individual pupil's needs. The learning plan will support each teacher's own work and teachers' planning and the mutual cooperation with the home.

Teaching of the language- and culturegroups, bilingual teaching

- The Sami language teaching is based on a communal vision of language: community membership and participation will be strengthened when the student learns to use the language of the community type.

6. Other DIYLab-related aspects

The drawing up and the importance of the local curriculum

The core issue: How students can experience a meaningful learning?

The need for development of activity culture and the pedagogy – the learning, the role of the student and pedagogic are at the center. o Every student needs a learning environment and a community, where they can find their own strengths and the joy of learning.

Basic education is the basis of general education

Essential emphases, phenomena-perspectives are emphasized and highlighted in the entire curriculum framework, especially in the local / the school / municipal level in the curriculum.

A uniform basic education culture

Learning environments are constituted of pedagogically rich, flexible package. The school's exterior and interior in addition to the natural and built environment is used as a learning environment.

Areas of information specific to working to promote the use of structured data structures, as well as the formation of the acquisition of new skills.

Learning and promote the welfare of the organization of school work

Shared responsibility of each school day. This will create conditions for the development of prosperity and learning, as well as ensuring the smooth running of of the school community activities.

Evaluation of learning

- To guide and encourage the study and to develop the student for self-assessment, student learning, work and behaviour are assessed a wide range of assessment is a means of pedagogy

- The evaluation will focus on the student's learning. (progress in learning, skill level, and feedback for them)

- Work (ability to plan, regulate, evaluate their own work, the ability to act responsibly, to try your best, ability to work in constructive interaction)

- Behaviour or taking into account other people, respect for the environment, common agreed rules and fact that compliance different interactive situations relevant and context-aware behaviour and good manners

- Evaluation during the studies is in all grades mainly with learning controlling feedback (continuous, daily, goal-oriented), students' knowledge level characterization with reports in at a given time

Learning and school support

- Learning and school difficulties is prevented in advance, for example, by differentiating instruction, teachers, and other staff by mutual co-operation, control and by modifying the study groups

Annex 3 – Czech analysis of the connections between DIY learning and the syllabi at the primary and secondary level

1. Autonomous/ Self-Regulated Learning

ZŠ Korunovační "gives pupils an opportunity to be involved actively in their own learning". It leads „them to indipendent and autonomous presentation, to acquiring new knowledge through their own activities". "It gives pupils an opportunity to apply in work principles of self-learning and self-control". "It enables pupils to exploit their own experiences and practical situation gained in a life out of school".

Primary School Education

ZŠ Korunova ní endeavours to support autonomous learning during a process of development of competency to learning. It gives an opportunity to pupils to use their experience in school; it leads pupils to self-evaluate and to understand why they have to learn; it contributes to develop habits to independent and self-learning. It leads to developmnet of the competency to solve problems, and of communicative competency.

Lower Secondary School Education

The main aim of Informatics teaching is besides other things ([4], branch ICT, Informatics, p. 2) to enable pupils to choice their own content in further to their needs (creation of presentation, information searching, text editing, drill and practice) and to exploit ICT knowledge, ability to do programming, etc.

2. Inquiry Based Teaching And Learning

ZŠ Korunovační doesn't think about inquiry based learning, nevertheless it supports a practical and experimental activities of pupils because it emphasises on "applying activities which can lead pupils to discover knowledge and relations and to solving problems" and on "performing simple demonstrations and experiments which enable pupils to acquire study content through more senses and to understand it".

Primary School Education

ZŠ Korunovační makes effort to promote inquiry based learning and teaching in development of competency to learning (to manage pupils in knowledge acquiring from different information resources and school materials), in development of competency to solve problems (to let pupils defend their conclusions, outcomes, decisions), in development of communication competency (to let pupils speak about each activity

joint to observed phenomenon or their own way how to solve problem; let pupils to speak about observation or watching in the nature or about interesting knowledge gained in reading) or in development of civil competency (lo manage pupils to regard and appreciate ideas or proposals made by others).

Lower Secondary School Education

In Informatics the pupils should learn to distinguish significant from insignificant, to do proposals various ways how to solve problems, to deduce and to conclude final decisions, or to speka about new-emerged problems. The pupils are taught to acquire startegies which allow them thoroughly analyse or unpack questions related to a studied problem, to propose and test various options how to solve it, to conclude/gather critically and carry out relevant arguments.

In a frame of the cross-curricular topic Media Education the school oa škole organises many projects which contribute to digital literacy development; there are some examples of such projects: Critical reading and viewing media messages (Year 6), Interpretation of relations between media messages and reality (Year 6), Media messages structure and organisation (Year 7), Viewing on authors of media messages (Year 7), Functionning and impact of media on the society (Year 8), Media message design (Year 8), and Work in a management team (Year 9).

3. Transdisciplinary Knowledge

ZŠ Korunovační "offers a lot of possibilities how to develop inter-disciplinary relations".

Primary School Education

ZŠ Korunovační supports inquiry based learning and teaching in a process of development of competency to solve problems (to enable pupils to search new information, to sort information and to connect them with study topics or themes), communication competency (to let pupils to speak about observation in nature, about knowledge gained in reading books or in watching TV infotainment).

Lower Secondary School Education

ZŠ Korunovační applies inter-disciplinary approaches in everyday teaching, particularly in cross-curricular topics and other project activities. From 2013 according to „Dodatek ke ŠVP ZV 3in" the school has impelemented into Informatics a theme, Finacial literacy" which has connections to the educational domains MATHEMATICS AND ITS APPLICATIONS and MAN AND SOCIETY.

4. Digital Competence

The digital literacy of pupils is developed in a compulsory subject Informatics in Year 4 (1 hour/week), and in Year 5-9 (1 hour/week or 2 hours/2 weeks). Teaching is organised in a multimedia computer lab.

The aim of Informatics is lead ([4], Oblast ICT, Informatika, p. 2) pupils to use ICT to good purpose and efficiently, to create obstacles to purposeless "playing computer games", to seek creative approaches to work with ICT, to apply knowledge and skills from Informatics in other school subjects (in the form of projects, presentations, digital outcomes, digital tutorials, etc.) and to let pupils to choose their own ideas in connection with their current needs (presentation creation, searching information, editing texts, drill-and-practice) and to exploit ICT knowledge. The pupil's own process of programming is a way for self-recognition and self-evaluation, for responsibility. The most important is to learn the principles of potential of application SW, not their manuals and guides.

According to the ZŠ Korunovační philosophy it is

Primary School Education

Media message creation is one of the cross-curricular topics for primary education in Year 4. The project „How an editorial-board works" further to the subject Informatics in Year 5 in which pupils learn process and use information.

Lower Secondary School Education

In the subject Informatics pupils learn to develop their self-confidence in own confidence and facilities to master (ŠVP, Oblast ICT, Informatika, p. 3). They should also learn to create peculiar attitude to ICT, to use various software and to work on different computers so that they be able easily adapt to transformed or new working conditions. From 2013 according to the document Dodatek ke ŠVP ZV 3in a topic Financial literacy has been implemented into teaching Informatics.

5. Collaborative learning

A term collaborative learning is not utilized in the school document ŠVP ([5]), nevertheless according to this document ZŠ Korunovační highlights communication and collaboration among pupils and leads them to project and group activities. The aim of the Informatics ([5], Oblast ICT, Informatika, p. 2) is to guide pupils to be able to explain acquired information to other, to ask questions each other, to answer them and to think about their practical use.

Primary School Education

ZŠ Korunovační struggles to support inquiry based learning and teaching within development of communicative competency (to teach pupils to listen to schoolmates' opinions, to discuss about opinions of other pupils, to respect each other; to speak about a procedure and methods for solving more complex arithmetic tasks, to attemp to advice to other schoolmates, to discuss about different problems, etc.), of social and personal competency (to guide pupils to learn mutual toleration and responsibility for fulfilling partial segments of common task), of civic competency (to manage pupils, if needed, to be able to ask help and to be able to be willing to help, as circumstances allow; to teach pupils to mutual communication in a congenial atmosphere).

"I appreciate myself and others" and „I can collaborate" are cross-curricular topics for primary education which are focused on pupil's ability to co-operate in Year 5.

Lower Secondary School Education

The subject Informatics facilitates to pupils (ŠVP, Oblast ICT, Informatika, p.3) to compare results of their work with outcomes of other schoolmates, to argument, to defend outcomes of his/her work, to learn from others, to follow and evaluate work of others, to provide advice and help to other schoolmates who have no computer at home or who have no adequate knowledge and skills.