

DECODE



**DEvelop COmpetences in Digital Era.
Expertise, best practices and teaching in the
XXI century**

**IO5. The training model to improve teachers
competence in the Digital Era.**

Final report

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1. Introduction

Digital technologies have modified social interaction, mobility, how data is managed and information is analyzed, with all of the aforementioned having a considerable effect on various different areas of human activity (Marqués Graells, 2013). In fact, the use of technology can be seen in a multitude of fields such as e-health, e-banking and e-learning among others. Therefore, given that ICTs affect all areas of life, it is vital that citizens are able to use them and consequently make the most of them and be digitally competent.

In order to ensure that citizens are more digitally competent, they must be trained to overcome the so-called digital divide. In line with Esteve and Gisbert (2011), considering students' digital skills is key to avoiding this gap; It is important that training and accreditation processes of such competence be designed since not all university students arrive with the same level. According to Piattini, Canca, Camarillo, Ruiz and Fuertes, (2016) there is already a training demand in this regard, since university students claim to intensify training and information in the efficient use of technological services at their disposal.

In this process of transformation based on ICT, the teacher is key since it is an active part of the educational and training organization in the classroom so you must carry out your professional activity taking advantage and effectively integrating the potential of technologies. In this sense, it is necessary that teachers value them as an essential element in the teaching-learning process, so it is not enough to just know or master them, but they must acquire "new professional skills that guarantee both knowing and how to know-how in and with ICT" (Falcó, 2017, p. 75); that is, they must acquire, in the same way as students, digital competence.

Various authors (Gisbert & Lázaro, 2015; Krumsvik, 2014a) have defined the Digital Teaching Competence (DTC) responding to the need of educators as a set of digital competencies specific to their profession to enhance and innovate education through technology. The European Framework for the Digital Competence of Educators: DigCompEdu (Redecker & Punie, 2017) details 22 competences organized in six areas that focus on how to use digital technologies to improve and innovate in education. However, in this investigation we focus on the definition of the TDC carried out by the Generalitat of Catalonia that distinguishes the instrumental TDC from the methodological one, understanding the latter as "the ability that teachers have to mobilize and transfer all their knowledge, strategies, skills and attitudes about technologies for learning and knowledge (TAC) in real and concrete situations of their professional practice to:

- a) facilitate student learning and acquisition of their digital competence,
- b) carry out processes of improvement and innovation in education according to the needs of the digital era, and
- c) contribute to their professional development in accordance with the processes of change that take place in society and in schools." (Generalitat de Catalunya, 2018, p. 11)

This definition categorizes the TDC into 5 dimensions: Design, planning and educational implementation, Organization and management of educational spaces and resources, Communication and collaboration, Ethics and digital citizenship and Professional development.

In line with Bustos López and Gómez Zermeno (2018), in this definition of TDC it is not only the application of technology that makes the teacher competent in the area, but their ability to integrate and apply it in their daily practice and in their professional development. Furthermore it supports the view of Prendes, Gutiérrez and Martínez (2018) who state that "it goes far beyond knowledge about how to use



technologies, since it implies knowledge and skills to carry out processes of selection and curricular integration of these technologies.” (2018 , p. 12). Therefore, it is necessary for teachers to familiarize themselves with innovative methodologies that allow the integration of ICTs so that students also acquire digital competence. This will also enable them to further their knowledge and achieve autonomous, meaningful and applied learning (González Rivallo & Gutiérrez Martín, 2017).

This report presents the training model in TDC developed in the framework of the DECODE project. This model (which constitutes IO5) was designed based on the detection of training needs as discovered via an online questionnaire that was completed by active teachers within the framework of IO4. This report shows the process of design, development and implementation of the training model based on a TDC seminar aimed at active teachers and which was implemented in Catalonia, Italy, Romania, Finland and the United Kingdom. In line with Gudmundsdottir and Hatlevik (2018) and Tejada and Pozos (2018) this seminar is based on the daily practice of the recipients to ensure the integration of the Digital Competence in their teaching practice. To carry out this training, a 100% online model with an active methodology based on the resolution of three collaborative challenges was proposed. The results suggest that the proposed proposal is a valid model for the acquisition of TDC.



2. Training model

This section will focus on the process of the teachers' needs detection and the design of the training model that was used throughout the DECODE project.

2.1. Needs detection

During the previous phase of the project (IO4), a needs detection was carried out using an online questionnaire, designed within the framework of the European project DECODE. The questionnaire included a section about the dimensions of the Teachers Digital Competence (TDC) defined by the Generalitat of Catalonia, as well as the teachers' self-rated training need for each one as answered on a scale of 1 to 5. The TDC dimensions were prioritized for the design of training by means of analysing the frequency of the results. Subsequently, a comparative analysis was carried on the two reference frameworks of the TDC both in Catalonia and Europe to elaborate a proposal of dimensions and descriptors of the TDC that constituted the basis of the training. To validate this proposal and prioritize dimensions and descriptors, an online questionnaire was conducted with national and international experts in TDC.

Considering that the design of the training was elaborated by the Catalan partners, it was based on the results of the questionnaire distributed to Catalan teachers during IO4. Concretely, it was distributed to the directors of around 4,500 educational centers in Catalonia who provided it to the teaching staff of their respective centers. A total of 425 answers were obtained. Subsequently, the online questionnaire for the prioritization of the descriptors was distributed to a group of 34 experts in TDC, both national (3 representatives of different Catalan universities, in addition to 19 teachers and TAC coordinators of educational centers) and international (12 members of the DECODE project).

From among the sections of the DECODE questionnaire, training needs were prioritized and presented based on the dimensions of the TDC defined by the Generalitat of Catalonia. Of all the dimensions a greater number of respondents (54%) showed a need for training in the design of training actions (methodology, activities, resources and evaluation) with the use of digital technologies. Secondly, 47% considered a relevant need for communication training and collaboration between teachers and students. In addition, they were also asked about the needs in the basic use of ICT being the least valued element (10%), an aspect that reinforces that the seminar focuses on the methodological side of the TDC.

The two reference frameworks of the TDC were compared in Catalonia (Generalitat de Catalunya, 2018) and Europe (DigCompEdu, 2017). From this comparison and taking into account the result of the analysis of the detection of needs, the dimensions of the Generalitat de Catalunya are enriched and reinforced while incorporating relevant elements of the DigCompEdu. Taking into account that the training should be applied online, for each of the dimensions, the use of digital technologies was reinforced and dimensions 1 and 3 were prioritized as a function of the detection of needs (see Table 1). In the case of the first dimension, methodological, resource and evaluation aspects were reinforced considering that they are specific areas of DigCompEdu. In dimension 2, digital information was incorporated, given that it is an aspect that DigCompEdu considers for students and was reinforced by the group of experts.



TCD Dimensions	Description
1.Design of training actions (methodology, activities, resources and evaluation) with the use of digital technologies.	<p>1.1. Use of digital technologies in the design of activities or learning situations.</p> <p>1.2. Application of innovative methodologies with the use of digital technologies.</p> <p>1.3. Definition of the monitoring strategy and methodology of evaluation of students in the teaching-learning process (self and co-evaluation).</p> <p>1.4. Search and selection of critical digital resources appropriate to the context and specific learning objectives.</p> <p>1.5. Incorporation of the digital competence of the students in the educational activity.</p>
2. Organization and management of information, resources and digital spaces.	<p>2.1. Appropriate application of the rules of environments and digital spaces (appropriate content, language, correct management of digital spaces).</p> <p>2.2. Optimization of digital information management</p>
3. Communication and collaboration using digital technologies.	<p>3.1. Use of digital technologies to communicate with colleagues.</p> <p>3.2. Participation in educational networks in digital environments.</p> <p>3.3. Promotion of the joint construction of knowledge based on digital technologies</p>
4. Ethics and digital citizenship.	<p>4.1. Respect for licenses in the use of digital resources.</p> <p>4.2. Awareness and presence of one's digital identity in all interactions on the network.</p>
5. Professional development.	<p>5.1. Reflective practice on professional activity applying digital technologies.</p> <p>5.2. Professional digital profile active in different networks and internally.</p>

Table 1: Dimensions and descriptors of the TDC for the development of the online training



These descriptors and indicators were validated and prioritized based on the questionnaire sent to national and international experts in TDC?. Both the first and second most highly related in 68.2% of the cases were the dimension of Design of training actions (activities, resources and evaluation) applying innovative methodologies with the use of digital technologies, with 54.2% selecting Communication and collaboration using digital technologies.

2.2. Training Design

During the next phase of the project, TDC training was designed for teachers active in Catalonia in an online seminar format. This design was validated by the same group of experts from the previous phase by means of a discussion group.

Also, during this phase, to validate the design of the training, a face-to-face discussion group was held with the 34 TDC experts involved in the previous phase.

Subsequently, the seminar was designed (see Figure 1). The approach of the online seminar format facilitates the staging of the TDC and promotes its flexibility. It is also based on collaboration among teachers since it is a fundamental element in their professional updating (Romeu, Guitert, Sangrà, 2016).

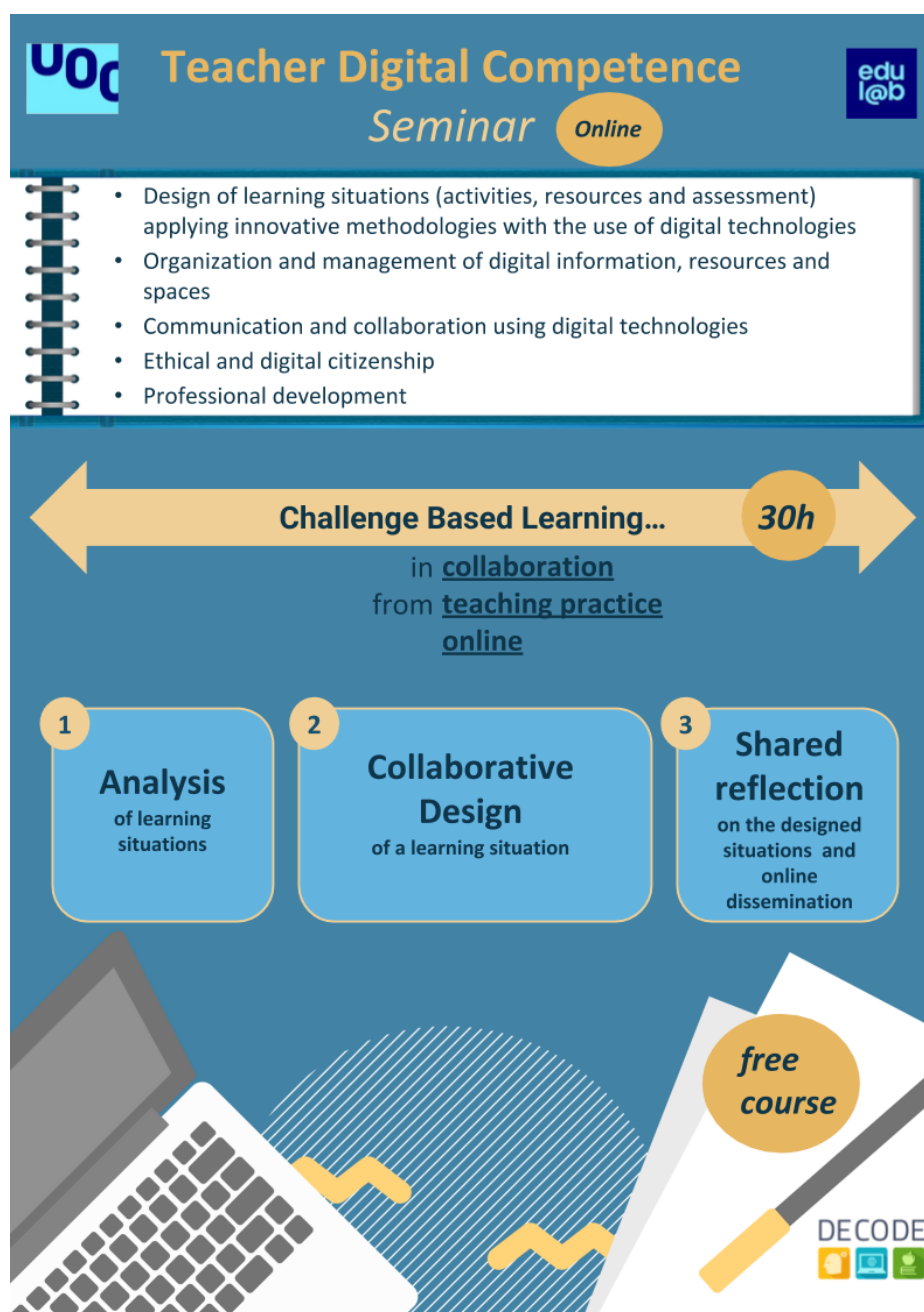


Figure 1: Teacher Digital Competence Seminar

The seminar was based on the definition of TDC of the Generalitat of Catalonia that understands TDC as:

“Teachers’ capacity to mobilise and transfer their knowledge, strategies, abilities and attitudes regarding ICT to real situations in their professional practice in order to: a) Facilitate students’ learning and the acquisition of their digital competence. b) Carry out processes for improving and innovating teaching according to the needs of the digital era. c) Contribute to their professional development in accordance to the changes that take place in society and in schools.”(Generalitat de Catalunya, 2018)



The objective of the seminar was to integrate and apply methodological TDC in their teaching practice by acquiring the dimensions and descriptions presented above. The seminar was held in a month. Next, we will go detailing its elements.

The **methodology** of the seminar was based on Challenge-Based Learning (CBL). The CBL approaches learning from a problem/situation and poses a series of challenges that students must actively achieve. It is a methodology that involves the participants in the definition of a solution to a real and relevant situation linked to their environment, in this case involves the design, in a collaborative way, of a learning situation¹ applicable to the teaching practice of the participants. A space for reflection and work based on the teaching practice was generated, allowing teachers to achieve digital competency.

The participants carried out collaborative work in small groups based on the achievement of three challenges:

- **Definition of the learning situation.** The learning situation is understood as the set of concrete situations used as a motivating challenge which can be resolved by the mobilization of knowledge and skills that allow it to successfully solve the task and develop the competences (Perrenoud, 2012).
- **Design of the learning situation carried out in a group.**
- **Assessment of the learning situation of another group and dissemination on the network of the learning situation.**

The seminar consisted of a set of **open educational resources** (OER) responding to the dimensions of the TDC. The methodology of the group work of the seminar as well as the diffusion in network of the designed activities, tried to promote the sharing among equals.

The evaluation model of the seminar was based on continuous assessment and considered the agents involved in the learning process. The participants were an active part of the assessment process based on the performance of self-assessment and co-assessment activities during the training process.

¹ Learning situation can be commonly named as "Good practice".



This seminar was implemented in a **Moodle virtual environment** using the Google Apps that were the tools most used by participants in their teaching practice and, in turn, facilitated collaborative work online.

The **role of the teacher** in this seminar was a proactive one and involved providing feedback to the participants to guide their training process.

2.3. Teaching plan

In order to explain in more detail, the training model that was designed and implemented during IO5, this section includes a table synthesizing the general information of the seminar.

General information of the seminar	
General objective of the seminar:	Integrate and apply the methodological teachers' digital competence. <i>The training of this seminar will be carried out fully online and collaboratively.</i>
Competences	<ul style="list-style-type: none"> • Design of learning situations (activities, resources and assessment) applying innovative methodologies with the use of digital technologies • Organization and management of digital information, resources and spaces • Communication and collaboration using digital technologies • Ethical and digital citizenship • Professional development
Teacher role	The teacher will be a guide and counselor (giving instructions for the resolution of the challenges and monitoring of the participants' progress). Also, it must promote and enhance interaction in shared spaces, encourage collaboration and anticipate possible problems during the seminar.
Methodology	<p>Challenge Based Learning (CBL) (involves the definition of a solution to a real and very relevant situation linked to participants' environment- Design of a Learning Situation applicable to their teaching' practice)</p> <p>Training participants have an active role and will work collaboratively in teams</p> <p>The seminar on teachers' digital competence is developed through a Challenge Based Learning (CBL) methodology. The CBL is understood as a methodology that involves the participants in the definition of a solution to a real and very relevant situation linked to their environment, in this case involves the collaborative design of a learning situation applicable to participants' teaching practice.</p> <p>A space for reflection and work based on the teaching practice will be created to acquire the teachers' digital competence. The training participants have an active role and will work collaboratively in teams.</p>
Activities	<p>1- Approach to the learning situation and beginning of collaboration</p> <p>2- Collaborative design of learning situations</p>



	3- Co-assessment and online dissemination of learning situations
Resources	Moodle environment and a set of digital resources (OER) organized by the seminar competences.
Assessment and monitoring	<p>The assessment of the seminar is based on continuous assessment and takes into account the different agents involved in the learning process. The teacher will provide feedback to participants during the seminar in order to guide their training process. Participants are also an active part of the assessment process performing self- and co-assessment activities.</p> <p>The assessment of the seminar is based on continuous assessment and takes into account the different agents involved in the learning process. The teacher will provide feedback to participants during the seminar in order to guide their training process. Participants are also an active part of the assessment process performing self- and co-assessment activities.</p>
Calendar	The seminar lasts 30 hours and will take place over a month.

Table 1. General information of the seminar

Subsequently, the three challenges that participants developed are detailed in the following tables:

1	Approach to the learning situation and beginning of the collaboration
Competences	<ul style="list-style-type: none"> • Communication and collaboration using digital technologies • Professional development • Ethical and digital citizenship
Challenge activities	<ul style="list-style-type: none"> • Presentation / Creation of digital identity (profile) The first activity that participants will have to develop should be a presentation of its teaching profile and its digital professional presence in the virtual environment of the seminar. If they do not have a professional profile in an online platform, they will have to create one in a platform of free choice (such as: video, about.me, twitter, linkedin, etc.). They will also have to customize their profile in Moodle (they will previously have access and will be able to view the course). • Analysis of learning situations Different learning situations (that can be considered best practices) will be given to students and they will have to analyze them individually using some guidelines provided by the teacher. Next, they will identify a real learning situation that can be considered a best practice. • Discussion about learning situations Participants will carry out a virtual debate during which they will share the analysis of the best practices provided by the teacher. • Forming work teams (definition of teams' agreements and planning) and definition of a learning situation The following activities will be carried out in teams (of 4 people recommended). With the guidance of the teacher, work teams will be



	<p>formed. Next, they will have access to a space where they can start the teamwork by establishing group agreements and work planning. The team will choose a learning situation to (re)design in the following activities. The chosen situation must favor the development of students' digital competence through the use of ICT.</p>
Resources	<ul style="list-style-type: none"> • Orientations for communication and collaboration in digital environments • Guidelines for ethical and digital citizenship • Guidelines for virtual debates • Best practices provided by the teacher
Calendar / Temporalization	1 week (10 hours)
Assessment	<p>Communication and collaboration using digital technologies</p> <ul style="list-style-type: none"> • Use of digital technologies to communicate with classmates (classroom spaces and collaborative environments). • Participation in online educational networks • Fostering collaborative knowledge construction through digital technologies. <p>Ethical and digital citizenship</p> <ul style="list-style-type: none"> • Awareness and presence of digital identity in all of participants' online interactions. <p>Professional development</p> <ul style="list-style-type: none"> • Reflexive practice on professional activity applying digital technologies. • Active professional digital profile in different online networks and in the seminar's environment.
Learning outcomes	<ul style="list-style-type: none"> • Teaching presence in participants' digital profile • Virtual discussion • Teams' agreements and planning • Learning situation chosen by each group

Table 2. Challenge 1 information

2	Designing collaborative learning situations
Competences	<ul style="list-style-type: none"> • Design of learning situations (activities, resources and assessment) applying innovative methodologies with the use of digital technologies • Organization and management of digital information, resources and spaces • Communication and collaboration using digital technologies • Ethical and digital citizenship



Challenge activities	<ul style="list-style-type: none"> ● (Re)Designing a learning situation Work teams will (re)design the learning situation chosen in the previous activity. In order to guide the design of the learning situation, a template will be provided with an orientation structure that must be followed as far as possible. Once the proposal is completed, the team will share it with the teacher for its assessment. ● Self- and co-assessment An individual self- and co-assessment activity will be carried out as a reflection of the activities developed during the seminar. This reflection will include a global assessment of the teams' dynamics.
Resources	<ul style="list-style-type: none"> ● How to design learning situations to promote student's digital competence. ● Recommendations for the search, selection creation and re-use of digital resources ● Strategies for students' monitoring and assessment ● Orientations for communication and collaboration in digital environments
Calendar / Temporalization	2 weeks (13 hours)
Assessment	<p>Design of learning situations (activities, resources and assessment) applying innovative methodologies with the use of digital technologies</p> <ul style="list-style-type: none"> ● Use of digital technologies in the design of activities or learning situations. ● Application of innovative methodologies with the use of digital technologies. ● Definition of the monitoring strategy and methodology for students' assessment during teaching-learning process (self- and co-assessment). ● Search and critical selection of digital resources appropriate to the context and specific objective of learning. ● Incorporation of student's digital competence to learning activities. <p>Organization and management of digital information, resources and spaces</p> <ul style="list-style-type: none"> ● Appropriate application of the rules of environments and digital spaces (appropriate content, language, correct management of digital spaces). ● Optimization of the management of digital information. <p>Communication and collaboration using digital technologies</p> <ul style="list-style-type: none"> ● Use of digital technologies to communicate with classmates (classroom spaces and collaborative environments).



	<ul style="list-style-type: none"> • Participation in online educational networks • Fostering collaborative knowledge construction through digital technologies. <p>Ethical and digital citizenship</p> <ul style="list-style-type: none"> • Respect digital resources licenses. • Awareness and presence of digital identity in all of participants' online interactions.
Learning outcomes	<ul style="list-style-type: none"> • (Re)design of a learning situation

Table 3. Challenge 2 information

3	Shared assessment and online dissemination
Competences	<ul style="list-style-type: none"> • Communication and collaboration using digital technologies • Professional development • Ethical and digital citizenship
Challenge activities	<ul style="list-style-type: none"> • Assessment of a learning situation The teacher will assign a learning situation to each participant for its assessment - based on a series of criteria. Subsequently, each participant will send his/her assessment to a discussion space, together with some questions for reflection addressed to the group that designed it. Those questions will be collaboratively answered in the same discussion space by the team that designed the assessed learning situation. • Online dissemination Finally, when the team considers that the design of the learning situation is completed, they will be able to disseminate it online.
Resources	<ul style="list-style-type: none"> • Guidelines for communication and collaboration in digital environments • Guidelines for ethical and digital citizenship
Calendar / Temporalization	1 week (7 hours)
Assessment	<p>Communication and collaboration using digital technologies</p> <ul style="list-style-type: none"> • Use of digital technologies to communicate with classmates (classroom spaces and collaborative environments). • Participation in online educational networks <p>Ethical and digital citizenship</p> <ul style="list-style-type: none"> • Respect digital resources licenses. • Awareness and presence of digital identity in all of participants' online interactions. <p>Professional development</p>



	<ul style="list-style-type: none"> ● Reflexive practice on professional activity applying digital technologies.
Learning outcomes	<ul style="list-style-type: none"> ● Assessment of a learning situation ● Review and improvement of the learning situation ● Online Dissemination of the learning situation

Table 4. Challenge 3 information

2.4. Training resources

In terms of the resources, we ensured that they were oriented towards competency training, approaching digital technologies from a methodological point of view. The most relevant ones will be explained in this section

How to Design Learning Situations to Promote Student's Digital Competence

The first and central training resource was entitled “How to design situation to promote student's Digital Competence” and it was designed to guide participants in the creation of their learning situations during Challenge 2.

It describes in detail the **changes in teachers' and learners' role**, introduces them in the most relevant **active methodologies**, gives them the tools to design the training **assessment** and to **design learning situations to promote students' Digital Competence**.

Regarding the changes in teachers' and learners' role, the resource considers Sangrà's perspective (2001) who states that the teacher is a facilitator of learning, promoting and guiding the whole process highlighting the subsequent roles:

- Training actions' designer
- Planner and organizer
- Facilitator and guide of the learning process
- Technical support
- Social moderator
- Assessor: follow up and feedback

The resource also considers the ever-changing role of the students, given that the changes occurring do not solely affect the teachers. The following changes can be mentioned for the learners:

- Active



- Responsible and manager of their learning process
- Learning to learn
- Using ICT in the learning processes

Considering the changes of these roles, **active methodologies** are central tools to promote students' learning. In the mentioned resource, the following methodologies are explained:

- Learning by doing
- Case-based learning
- Gamification
- Project-based learning

Regarding the **assessment**, the resource focuses on establishing mechanisms in order to evaluate and provide feedback on the progress of the students, or use certain tools, such as rubrics to help students take control of their advances, as well as helping teachers.

It considers different types of assessment, depending on how this is applied throughout the process and depending on who does it (see figure 1).

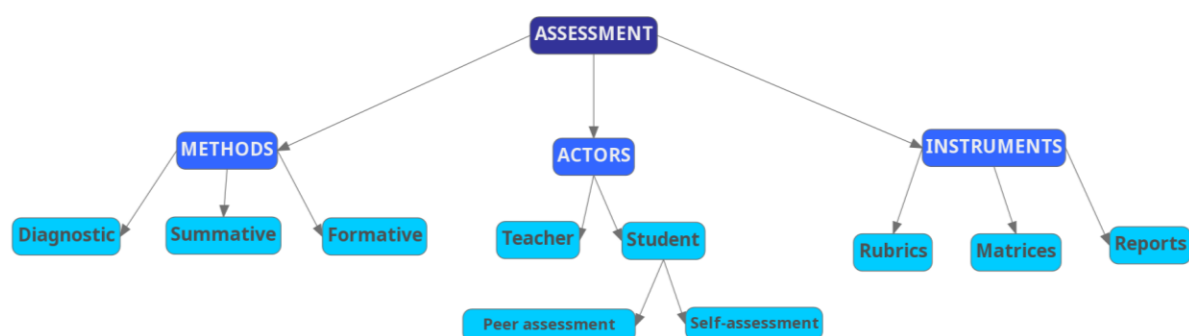


Figure 1. Assessment

And it details three different types of assessment:

- Diagnostic (initial)
- Formative (continuous)
- Summative (at the end)

Regarding the **design of a learning situation**, it is necessary to highlight how a learning scenario for students' Digital Competence can be created. This resource recommends participants to elaborate it from scratch or adapt a Scenario already created or re-using other educational materials. In addition, it states that a learning situation has to include the subsequent key elements:

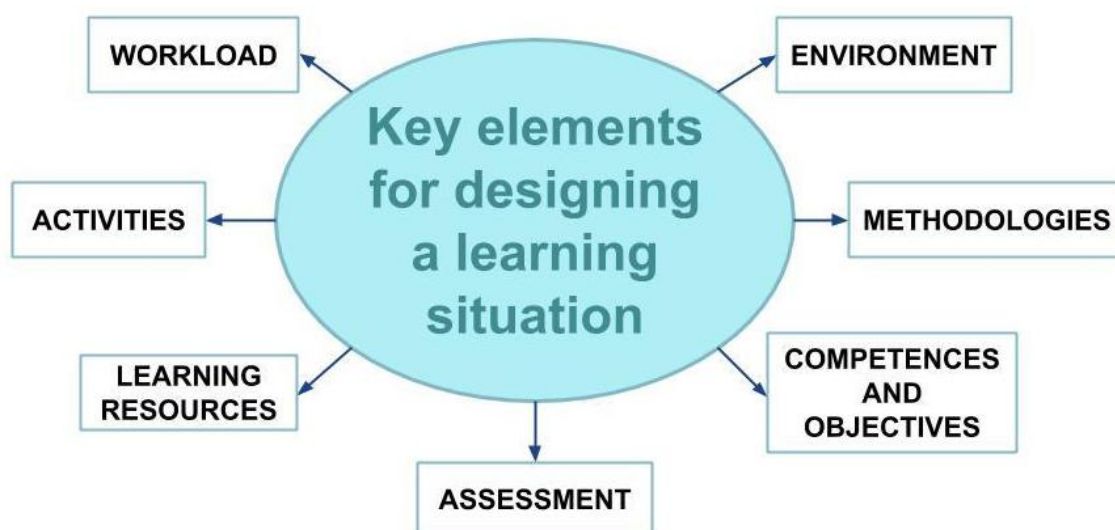


Figure 2. Important elements for the learning situation

Digital Communication and Collaboration

Considering that most of the seminar's activities were based on online collaboration among participants, one of the central resources pointed out this methodology.

The main themes explained in this resource are:

- Define digital communication and its relevance as well as the various ways that one can communicate digitally.
- We also chose to distinguish between private and public digital communication. This included a discussion and consideration of the features regarding e-mail, instant messaging services and video-conferencing services.
- Following this we focused on public communications and social media which involved a reflection upon social communication strategies in relation to forums, blogs, and social networks.
- Networking (strategies and potential of networking; tools)

Searching, selecting, creating and (re)using digital resources



Considering that participants had to find online educational resources related to their learning situations, the last core resource for the training gave them strategies to search for them. Even Though it wasn't mandatory to design their own resources, it explained some tools for the design of digital resources as well.

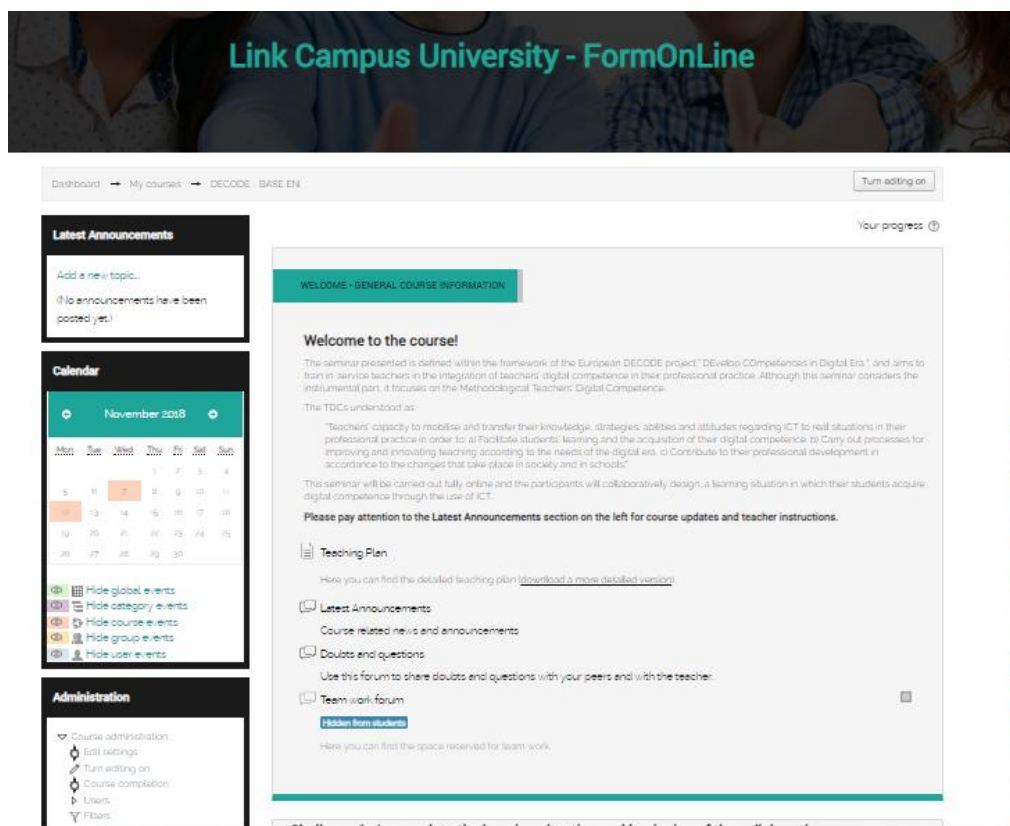
The most important themes explained in this resource are:

- Learning Resources explaining the different types of educational resources.
- Digital Learning Resources that can be found in the internet.
- **Searching.** This section gives participants strategies to effectively search learning resources on the internet and store the relevant information found during the search.
- **Creating.** In order to give participants tools for creating their own resources, it shows them free and open software tools.
- **Selection.** This resource highlights the importance of learning resource selection focusing on the selection of content itself, methodology, socio-cultural considerations, visuals, videos and DVDs, digital resources, web resources and finally the learning objects “travel well” quality model.
- **Licensing:** Finally, the resource considers the legal aspects and creative commons licences.



3. Pilot training

For the pilot training of the study, the original model previously explained and designed by the Spanish (Catalan) partners was implemented in Moodle (pictures 1 & 2). The Moodle course was replicated in all of the other countries except for Finland, in order to adapt it to their own context.



Picture 1. Welcome page of the Moodle Course



Challenge 1: Approach to the learning situation and beginning of the collaboration

This challenge integrates:

Task 1.1: Presentation / Creation of digital identity (profile)

The first activity that participants will have to develop should be a presentation of its teaching profile and its digital professional presence in the virtual environment of the seminar. If they do not have a professional profile in an online platform, they will have to create one in a platform of free choice (such as: video, about.me, twitter, linkedin, etc.). They will also have to customize their profile in Moodle (they will previously have access and will be able to view the course).

Task 1.2: Analysis of learning situations

Different learning situations that can be considered best practices will be given to students and they will have to analyze them individually using some guidelines provided by the teacher. Next, they will identify a real learning situation that can be considered a best practice.

Task 1.3: Discussion about learning situations

Participants will carry out a virtual debate during which they will share the analysis of the best practices provided by the teacher.

Task 1.4: Forming work teams

The following activities will be carried out in teams (of 4 people recommended). With the guidance of the teacher, work teams will be formed.

Task 1.5: Definition of teams' agreements and planning and definition of a learning situation

Next, they will have access to a space where they can start the teamwork, by establishing group agreements and work planning. The team will choose a learning situation to redesign in the following activities. The chosen situation must favour the development of students' digital competence through the use of ICT.

Below this description, you will find a page with the resources that will serve you for this challenge.

Page: 1
Progress: 0 / 1

1.1

Task 1.1: Presentation / Creation of digital identity (profile)

The first activity you have to develop is a message in the [Presentation Forum](#) (that you can find below this statement).

In this message, you must present to the rest of the classmates and also have a link to your teaching profile and/or your digital professional presence on the Internet.

If you do not have a professional profile in an online platform, you must create one on a free-choice platform (such as: [about.me](#), [twitter](#), [linkedin](#), [social.GNU](#), [Mixpod](#), etc.).

On the other hand, you will also have to customize your profile in Moodle.

Forum: 1
Progress: 0 / 1

1.2

Task 1.2: Analysis of learning situations

Different learning situations that can be considered best practices will be given to students and they will have to analyze them individually using some guidelines provided by the teacher. Next, they will identify a real learning situation that can be considered a best practice.

To conclude, please answer the following questions:

Picture 2 example of a challenge of the seminar in Moodle

In order to ensure the efficacy of the model, all partners were provided with guidelines for how to apply it which included communication with students via messages explaining the activities and the process of the course, alongside an evaluation guide. The following is a brief description of how we carried out the process.

- We considered two key elements (i) assessment and (ii) feedback.
- Assessment was provided either individually or as a team.

Feedback was related to classroom feedback as well as team feedback. replicated in four different countries, with one (Finland) creating and adapting their own version relevant to their context.

Below we provide information regarding the collated data from each country based on the pilot training.

- **Catalonia:** 97 participants enrolled in the seminar and 51 finished it (but 47 filled the final survey) and it lasted 5 weeks.
- **Finland:** Pilot finished with 50 students enrolled and 20 finishing the course. The seminar lasted 8 weeks.
- **Romania:** Pilot finished with 350 participants enrolled, out of which 200 accessed the platform at least once and 96 that finished the seminar. The seminar lasted 6 weeks.



- **Italy:** Pilot started with 250 participants enrolled in 5 classrooms composed by 50 people. 60 participants finished the seminar. The seminar lasted 15 weeks.
- **UK:** Due to problems with students' enrollment and completion of the seminar, they had 3 people engaged. It will be explained in the section regarding their pilot.

The process for the pilot training involved the implementation of surveys. Firstly, there was an initial survey made available to all partners. This can be found in the annex. Subsequently we implemented the Moodle course with the guidelines. Finally, we sent an individual survey to each country member, which was then used to develop the national reports for each country which we provide below.

3.1. Catalonia

3.1.1. Context

This national report is part of the DECODE PROJECT (DEvelop COmpetences in Digital Era Expertise), best practices and teaching in the XXI century, an Erasmus+ KA2 Strategic Partnerships in the field of Education, intellectual output 5 (hereafter: IO5). Considering the context, the pilot was implemented with Catalan teachers.

3.1.2. Adaptation of the training model for the pilot

Due to the fact that the training model was developed by the original DECODE Team, no changes were made to it throughout the research process. The process of the design of the training is explained in the previous sections of this final report. It is worth noting however that an adaptation was made in the sense that the seminar went from 4 to 5 weeks long.

3.1.3. Sample description

51 teachers (currently employed) participated in the seminar with a total of 47 responses received for the questionnaires. The average age of participants is 41 years old, but it must be noted that 50% of respondents are over 42 years old. In terms of gender the sample was quite balanced, with 55.3% females. The majority of participants (51.1%) are teachers in Secondary Education, however 36.2% are teachers in Primary Education, 21.3% Bachillerato, 14.9% in Infant Education, and 10.6% in Training Courses (Ciclos Formativos). Almost half of participants (49%) stated that their students were digitally competent, yet they rated their own competence lower (36%).



In relation to the seminar itself, data was analysed in order to understand the current level of TDC abilities in the sample. 94% of participants stated that they had previous experience in online course/training. This result suggests that this portion of participants would have basic knowledge of how online seminars work and as such does not suggest any restrictions in carrying out the course online. Following this we analysed the motives for which the participants were interested in taking part in the seminar. The most notable results include the fact that 87% of them wanted to improve their teaching experience and 72% had a general interest in TDC. Also, the results showed that 53% wanted to update their professional knowledge/skill, 40% expressed a need for training in TDC and a further 40% considered it necessary to partake in shared training experiences with fellow teachers.

3.1.4. Self-Perception of Digital Competence

One of the main aims of the seminar was to promote critical thinking and self-reflection in relation to TDC. Results show that this was achieved, evident from the 89% of participants who stated that the seminar had helped them to become more conscious of their digital competence skills.

Participants were asked to assess the degree of development of the TDC descriptors based on the seminar activities. Furthermore, in order to evaluate the difference between participants' self-perception of their TCD acquisition level, a comparative analysis was conducted on the competency descriptors previously described, shown in the graphs 1 - 5. To present the results, we focused on the percentage of participants who described themselves as having a *high* or *very high* rating of them in the seminar.

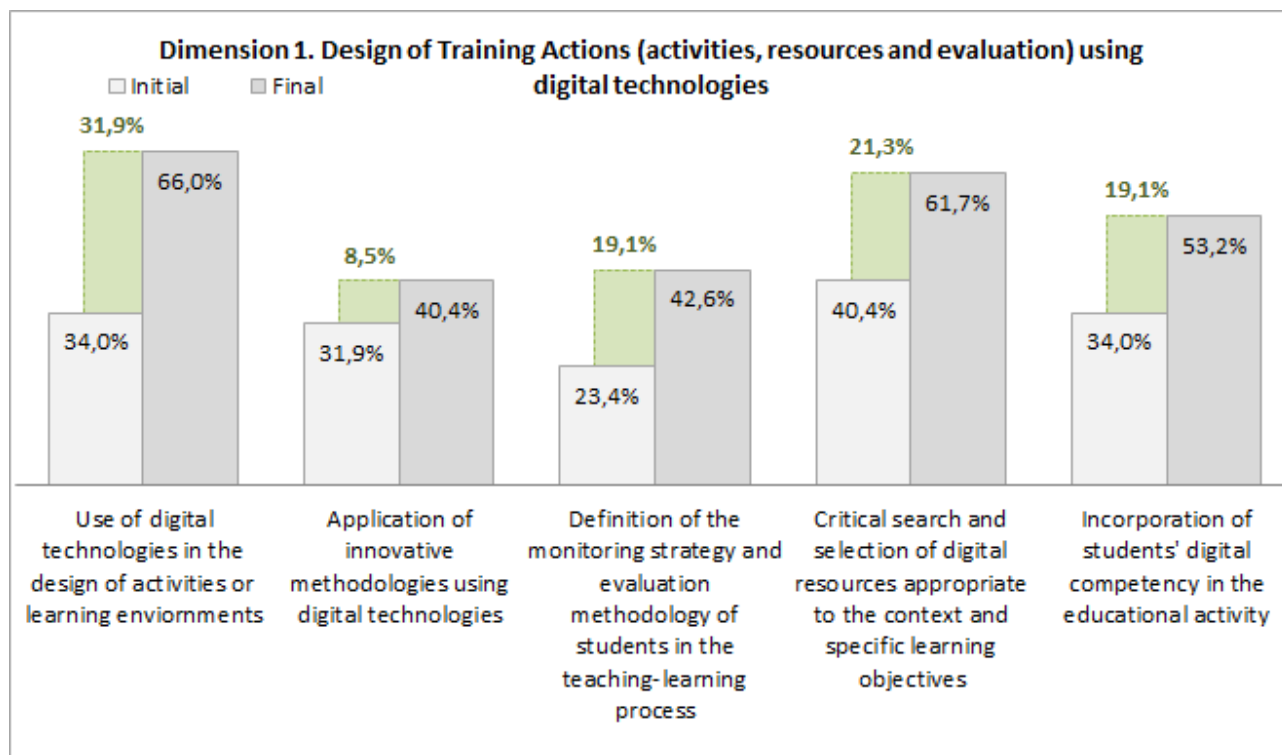
In terms of the first dimension of TCD '**Design of training activities (activities, resources and evaluation) using digital technologies**', approximately 70% of participants felt they had a high level of development for 4 of 5 descriptors within the dimension:

1. Incorporation of students' digital competency in the educational activity (72%)
2. Use of digital technologies in the design of activities or learning environments (70%)
3. Definition of the monitoring strategy and evaluation methodology of students in the teaching-learning process (self and co-evaluation) (68%)
4. Critical search and selection of digital resources appropriate to the context and specific learning objectives (68%)

The remaining descriptor, Application of innovative methodologies using digital technologies, more than half of the participants (75%) felt they had a high level. These results can be interpreted as a sign for the efficacy of the seminar in relation to this dimension, given that participants considered that they had developed it adequately. For further understanding of the data analysis, we present the results of the

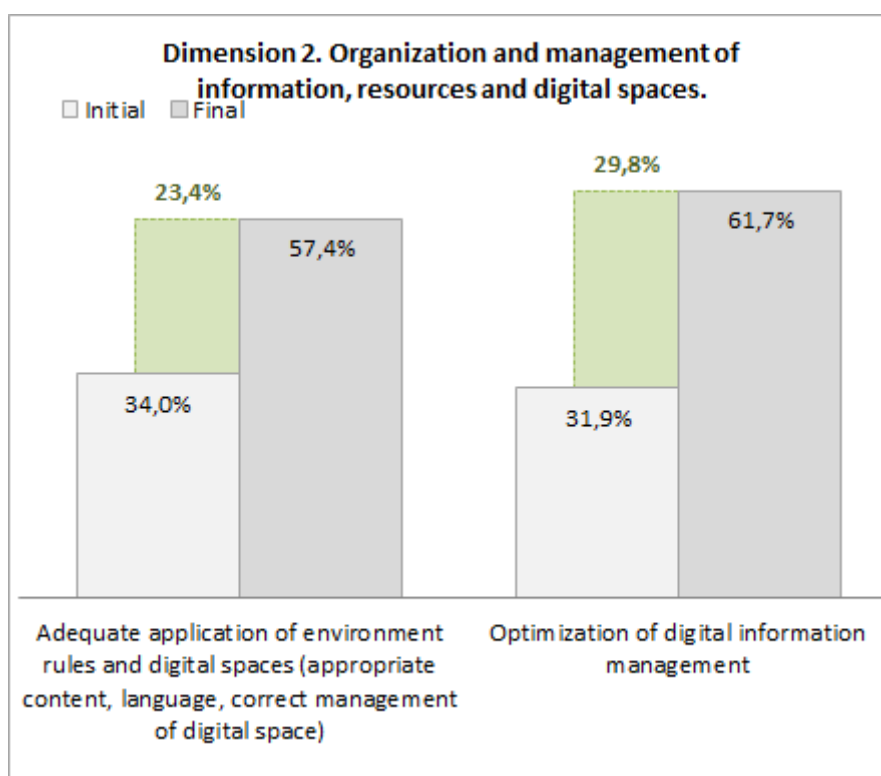


difference in participant perception in relation to their level of acquisition of each descriptor in each

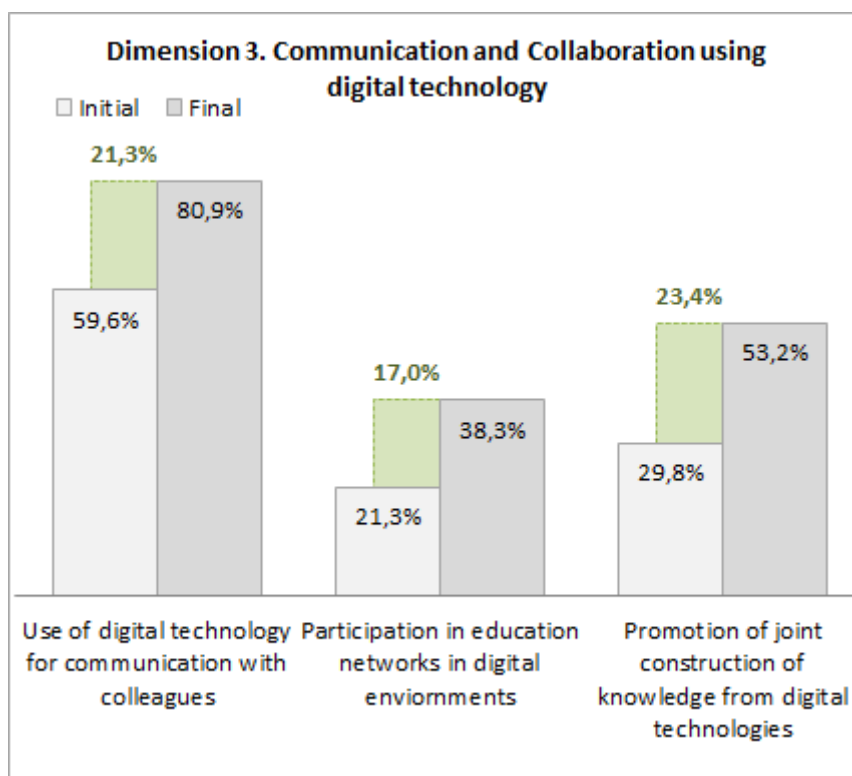


dimension (Graph 1).

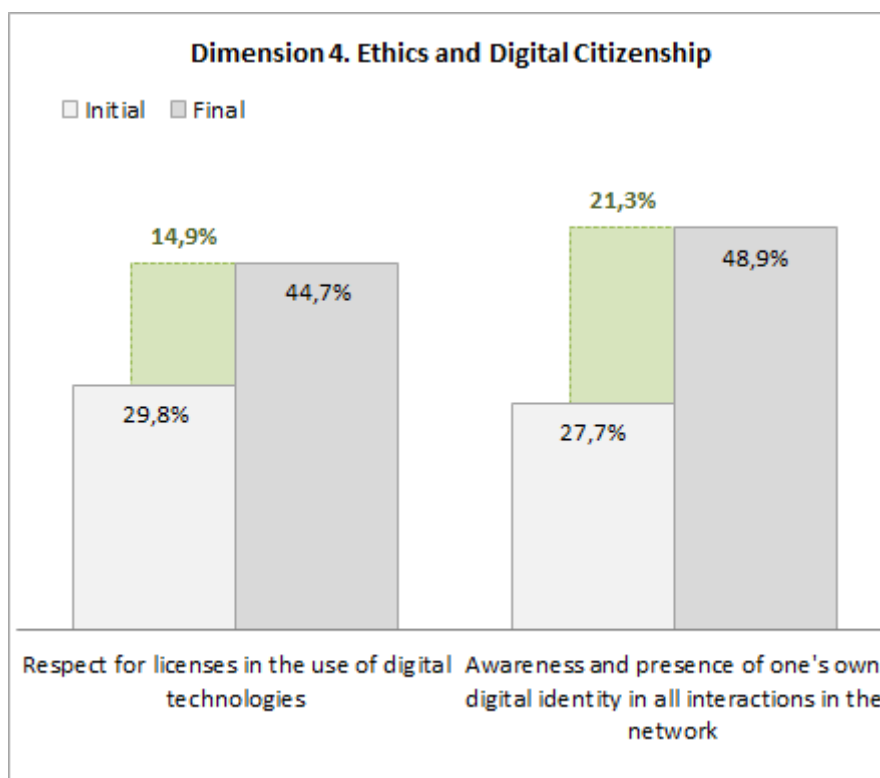
Overall there were big improvements for each dimension of TDC. As such, these results show that the seminar was an effective method of improving these skills amongst the Catalan teachers who partook in the research. Specifically, in relation to the second dimension of TDC “Organization and management of information, resources and digital spaces”, more than half of the participants demonstrated an elevated level of improvement, shown by the following results: Adequate application of environment rules and digital spaces (appropriate content, language, correct management of the digital space - 66%), Optimization of digital information management (57%). In Graph 2 the increase in acquisition level of participants can be observed for this dimension.



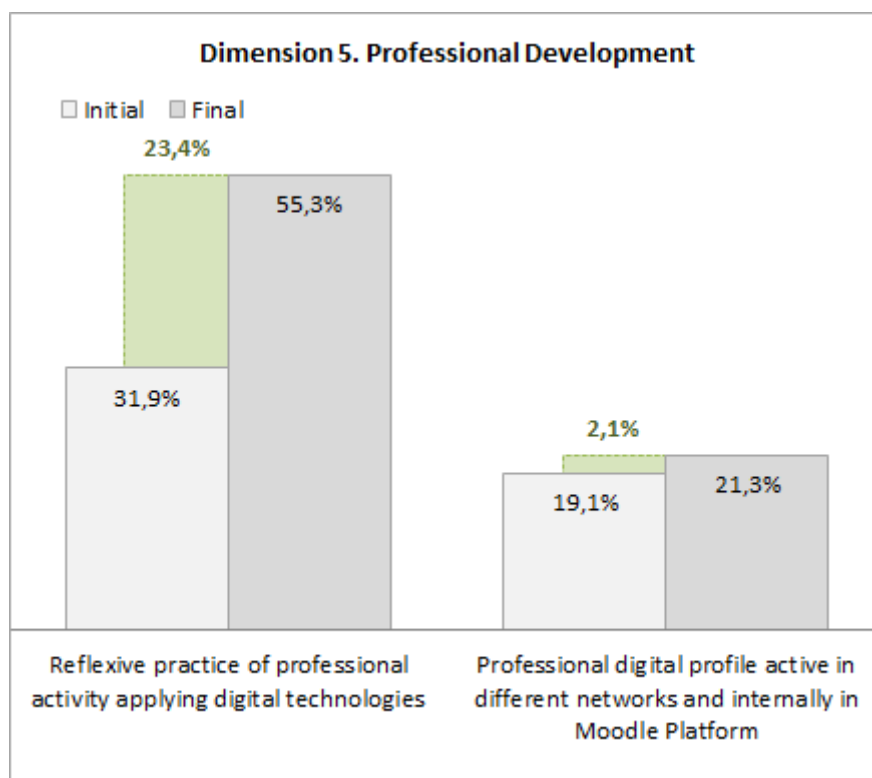
The third dimension, Communication and Collaboration using digital technology, contains the descriptor with the highest development in the seminar: 79% of participants reported a high improvement in the Use of digital technology for communication with colleagues. A further descriptor of which reported a high growth in development was Promotion of joint construction of knowledge from digital technologies. This growth is due to the fact that a large part of the seminar was developed online and in groups. However, only 45% of participants noted a high improvement for the other descriptor mentioned in this dimension, Participation in education networks in digital environments. This was the descriptor with the least improvement overall. This result is due to the fact that the work of the seminar relegated the participation in this type of networks to a voluntary activity. As seen in Graphic 3, the increase in the number of participants with a high level in the descriptors of this dimension is also worth mentioning.



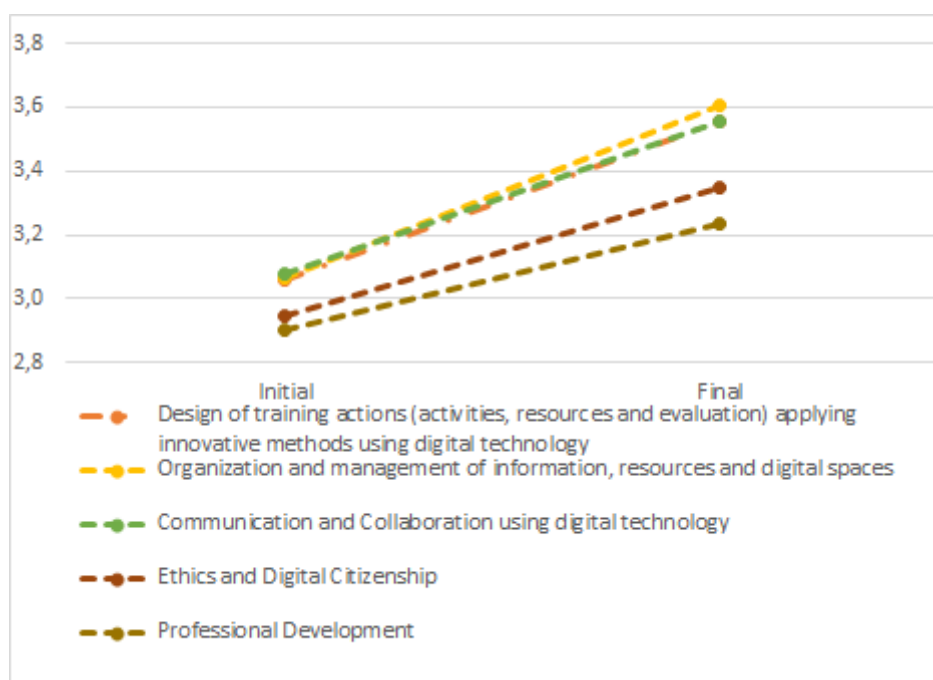
Furthermore, approximately half of participants noted a substantial development of the descriptors in the 4th dimension, Ethics and Digital Citizenship: Awareness and presence of one's own digital identity in all interactions in the network. This received a medium to high score for development in 60% of participants. Similarly a 53% increase was seen with respect to licenses in the use of digital resources. Graph 4 illustrates the participant increase with a high level in the aforementioned dimensions.



Finally, in the last dimension, Professional Development, a significant difference was found between descriptors: most participants (66%) demonstrated a high level of development of the descriptor Reflective practice of professional activity applying digital technologies. In contrast, only 26% rated a high development of the descriptor Professional digital profile active in different networks and internally in Moodle Platform. Graph 5 highlights the descriptor with the lowest level of acquisition and least difference given that it was not addressed in the seminar.



On a final note, we would like to focus on the teachers' perception regarding their improvement level of TDC dimensions, we again emphasize the effectiveness of the course according to these improvements and highlighted in Graph 6. This graph demonstrates that participants showed growth in their perception across all dimensions.





3.1.5. Evaluation of the seminar

Methodology of the course

To evaluate the methodology of the course, a continuous evaluation approach was undertaken. Furthermore, this approach ensured that all learning processes are accounted for. As such, participants play an active role in the evaluation process from the beginning of the activities through self and co-evaluation.

In terms of the methodology, all participants (100%) stated that they were satisfied with it and felt that the objectives of the seminar were met. Moreover, online collaborative learning was an important factor that aided in the development of TDC skills, supported by the fact that 89% of participants evaluated it positively.

Resources

The resources were consulted on average by 31 people, of which 29 (96%) considered them slightly, quite or very useful to participate in the seminar. The most consulted resource according to 91% of the results was How to design learning situations that promote the digital competency of students. This resource was scored as useful by all participants who consulted it. Moreover, the other two resources which were consulted, by 83% of participants were Orientations for virtual debates and teacher digital competence. Both of these resources were rated useful by 90% and 100% of the participants who used them respectively.

Teacher role

Positive results were found for 'teacher role'. Almost all participants (98%) stated that the orientations were clear, and their communication was very useful for organizing the work. In terms of their role, although on a lower scale than the aforementioned items, the results supported the importance of them for the implementation of the seminar, given that 94% of participants considered the teacher role has become key for the development and the related feedback aided in bettering their work throughout the seminar. These results were corroborated by responses from the open questions. Examples include: "The feedback from the trainers was very enriching" (Participant 1); "the validation is very positive, and I am grateful for the effort made. The teacher provided an excellent guide for us and accompanied us along the way" (Participant 2); "I would like to highlight the interest of the trainer. He was attentive throughout and constantly informed us of all we needed to know" (Participant 3).

Transferability

In terms of transferability, we would like to draw attention to the 87% of participants who consulted the resources stated that they were extremely transferable for their teaching. 89% of participants stated that they will transfer what they learned to their colleagues where they work, reinforcing the effectiveness of the seminar itself. Furthermore, a large majority (94%) would recommend the seminar to a colleague



highlighting its success. This transferability can be further seen based on feedback from participants, for example, “The themes of the seminar were interesting and will be very useful when applied in the classroom. I hope to be able to apply it soon!” (Participant 4).

3.1.6. Suggested improvements

This section is dedicated to any limitations we encountered during the piloting, with suggestions of how this may be remedied in future implementation of the designed training. Firstly, the main limitation of the training was the time limit offered to achieve the desired objectives. In particular, the time limit was restrictive in terms of optimal development of the proposed challenges and goals. Some participants echoed this sentiment stating that one month was not enough time to design learning situations to a satisfactory in-depth level as well as collaboratively. As such, one way of addressing this potential issue is to offer courses for a longer amount of time in order to allow participants more time to engage more in-depth with the topics covered. Related to this is the fact that the training was delivered through an online mode. Participants commented that whilst they did enjoy this aspect of training that it would be useful to have some form of post-training forum in which they could keep in contact and collaborate further when desired. This would allow participants not only to collaborate but continue sharing knowledge and relevant experiences with each other, suggesting that this type of research could have a long-lasting impact given the right circumstances and resources.

3.1.7. Conclusion: final reflection

Finally, it is important to note that the TCD experts who took place in the face-to-face group discussion considered it of vital importance that there are teachers or groups of teachers who promote educational transformation. In this sense, the seminar presented here looks to form leaders who demand change and innovation in their respective institutions and professional network, which was also acknowledged by participants in the seminar, for example, “This is the path to follow! This seminar should be carried out in the majority of centers, or the TAC coordinators to train the teachers of the institution” (Participant 5). Previous research such as that of Pozuelo (2014) also reflected this idea that the training of teachers is a key factor in the methodological change in institutions, as well as the fact that the more experience and training they have had, the more likely they are to implement and share these skills.



3.2. Finland

At home in digital time- Finnish pilot

Writer Jenni Nurmisto

3.2.1. Context

The Finnish pilot course was called At Home In Digital Time and it was carried out between November 2018 and February 2019. The Pilot was carried out in Finland, Omnia Joint authority of education in Espoo region. The target of the pilot was VET education teachers for all occupation areas as well as general subjects' teachers. Students were recruited to the course via e-mails, tv-commercials and posters around Omnia. Students enrolled in the course through the link sent to them via email.

Pictures 1-3. Course Advertising Carousel

KOTONA DIGIAJASSA

DECODE

moodle

1. Digitaalinen minä ja netiketti
2. Digiaineistojen tekeminen
3. Verkko yhteisöt ja -viestintä
4. Parviäly ja tiimioppiminen
5. Palaute ja vertaisarviointi verkossa

- 4 yksilötehtävää
- 3 ryhmätehtävää
- oppimisyhteisöjä
- hyviä käytänteitä

Tapaamiset

ALOITUS
tiistaina 30.10. klo 14:15 - 16
tai
perjantaina 2.11. klo 10 - 12

YHTEISARVIOINTI
perjantaina 14.12
klo 10 - 12

Co-funded by the
Erasmus+ Programme
of the European Union

Picture 1



KOTONA DIGIAJASSA

- Tapoamiset eivät ole pakollisia
- Osa oppimisaineistoista on englanninkielisiä
- Oppimistehtävissä on paljon vapamuotoisuutta ja tilaa henkilökohtaistamiselle

Lisätietoja saa koulutuksen vetäjiltä



Anssi.Kuisma@omnia.fi
Jenni.Nurmisto@omnia.fi
040 126 7430
7571



040 126 7571

Ilmoittautuminen osoitteessa:
bit.ly/kotodigi



VERKKOTOTEUTUS OMNIAN




Co-funded by the
Erasmus+ Programme
of the European Union

Picture 2

KOTONA DIGIAJASSA

ONKO NETIKETTI TUTTU?

OPEOAJAMINEN DIGIAIKANA

OSAATKO TEHDÄ MEEMEJÄ?

KEHITÄ DIGIPEDA-TAITOJASI

NYYPÄSTÄ KISÄLLIKSI

IDEOT JA KESKUSTELE VERKOSSA

KIINNOSTAATKO PELILLISÄMINEN?




LISÄTIETOA:
Anssi.Kuisma@omnia.fi - 040 126 7430
Jenni.Nurmisto@omnia.fi - 040 126 7571

Ilmoittaudu osoitteessa
bit.ly/kotodigi



Aloitukset
ti 30.10. klo 14:15 - 16
tai
pe 2.11. klo 10 - 12

Oppimiskahvila ja
kursinpalaute
pe 14.12. klo 10 - 12

VERKKOTOTEUTUS OMNIAN




Co-funded by the
Erasmus+ Programme
of the European Union

Picture 3

3.2.2. Adaptation of the training model for the pilot

The training course started in November 2018 and ended in February 2019. The course was created on Omnia's Moodle platform instead of the originally planned Link campus Moodle. The training course was copied from Omnia's platform to Link campus platform. Also, the duration of the course was extended from 1 month to 2 months to give students a chance to complete the learning assignments.



3.2.3. Sample description

47 students registered and 34 signed into the course. In the end, 15 students completed all the assignments for the course. All the participants were from Southern Finland, 13 of them were female and 2 of them were male students. All students had pedagogical competence and 9 of them had bachelor's degree and 6 had a Master's degree. Students' goals and motivation to participate in the course were diverse but the overall suggestion was that they all wanted to learn more about digital learning and teaching methods.

3.2.4. Methodology of the course

The creation and planning of the course began in June 2018. The study contents followed the guidelines received from the work package leaders and the project partners from the Open University of Catalonia. Two teachers and a coordinator planned the course. Another teacher was responsible for digital competence contents and another teacher was responsible for pedagogical solutions during the course. The coordinator took part in quality assurance. The teachers' roles were to guide and support students during the course.

The methodology of the course was based on digital methodologies such as videos, web links, discussion groups, group working, questionnaires, tests and e-mails. Classroom teaching was provided twice; in the beginning of the course and at the end of the course. In the beginning 18 students took part in classroom teaching and only 2 students in the final meeting at the end of the course. Classroom teaching was totally optional for students. In the beginning it included grouping, introducing each other and presentation of the course. The final meeting included conclusions about course topics but also feedback from the course. Overall the methodology was very student centered and required an independent studying attitude from students.

3.2.5. Teaching materials and learning modules

The course started with classroom teaching. It was optional for the students to take part in classroom teaching and same content was provided for the students to take part in classroom activities for all who wanted. In the classroom course platform the modules were presented for the students. Students had the opportunity to ask questions and have guidance for the course studies in classroom meeting. Also Kahoot! which tested students' knowledge about digital skills was carried out during classroom teaching. At the end of classroom teaching group devoted time to get know each other with playful games.

The moodle course started with a course information module focusing on the course learning modules, schedules, deadlines and also teachers' contact information.



The course included 6 modules: 1) Digital me and netiquette, 2) Making digital material, 3) Online communities and communication, 4) Swarm intelligence and team learning, 5) Feedback and online evaluation and 6) English learning materials. Each learning module included learning material and tips for carrying out learning assignments.

Module 1 included two assignments. At the first students had to download their profile photo and update their Moodle profile. The second assignment included free form self-introduction and technical tips for students.

Module 2 included two assignments as well. In the first one students were asked to learn about an existing learning package or method that utilizes digital tools, Analyze the learning package with these questions, Then open a new discussion under "Material Studies", briefly present the learning package you are studying and share your own views. Also comment at least one other refund. Suggested resources were Finnish national board of education Good practices web page (<https://hyvatkaytannot.oph.fi/etusivu/>) and oer commons (<https://www.oercommons.org/>). In the second learning assignment, students were guided to design an ideal for a pedagogical need that they would like to work with to plan a learning activity using digital tools.

In Module 3 students were guided to examine the restorations of previous tasks, especially group ideas. They also had to:

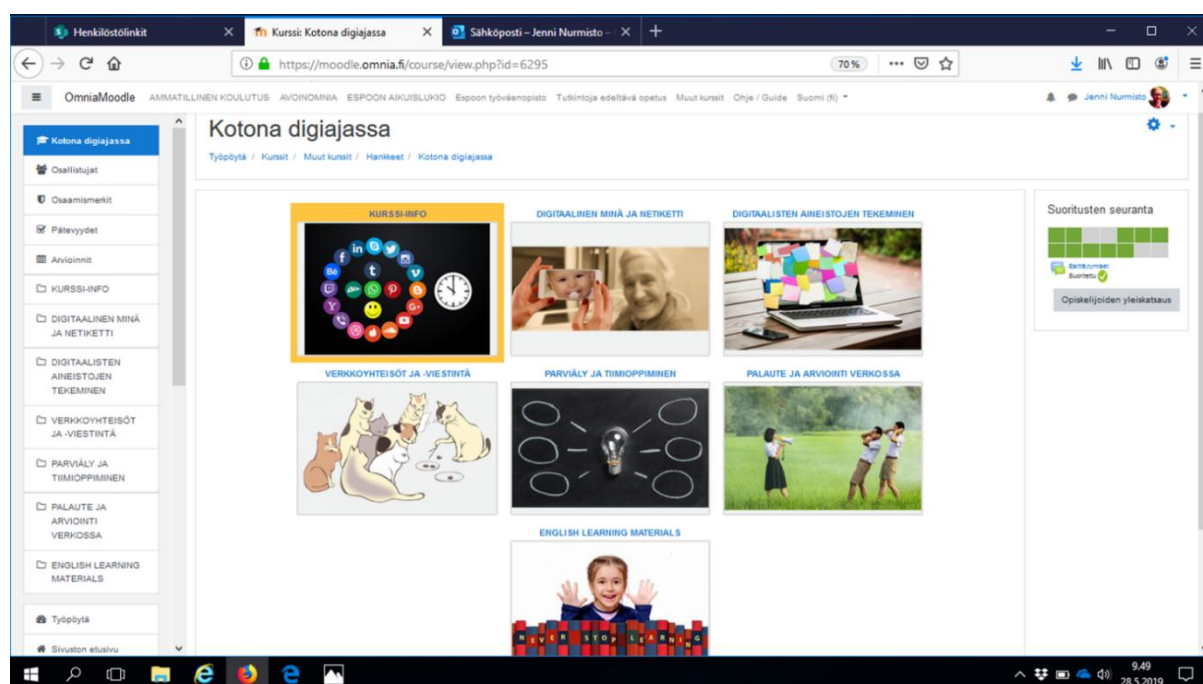
- Discuss the same kind of course with interested course students and form Teams of 4-5 people.
- Match your team's composition, task, and title in "Team Building".
- After that, the course leaders open a new, closed forum with the name of the team.
- Discuss with the team and design a digital-based learning package.
- Save the plan in your optional format, open a new discussion in the "Team Task" section of the next section of the course and share your plan there.

In Module 4 students had to open a new conversation under "Team Task" and upload/attach their learning plan there.

Module 5 included a sheet to evaluate colleague teams group. It also involved:

- Analyze your learning plan (see the relevant link by clicking on the link below: Job sharing in evaluations) using the same principles as analyzing existing learning entities under "Creating Digital Materials". You can also submit additions / suggestions for improvement to the plan.
- Open a new conversation in the section of your learning plan and share your views there.
- Groups were also encouraged to think about feedback from other students about their plan..

Module 6 included English learning materials: ICT in education, Managing VLEs, Digital citizenship, Professional development, selection and creation of digital resources. The sixth module did not include any learning assignments.



Picture 4. Course platform and learning modules

3.2.6. Evaluation of the seminar

A Final questionnaire was sent to all 15 students who completed the course. It was sent via e-mail at the same time with course certification in May 2019 and students were asked to fill out the questionnaire. By June 7 students answered the questionnaire. 1 of the respondents answered that he /she didn't complete any learning modules. Other students completed all the learning modules though very few of them studied the English learning materials.

Respondents' answers were overall quite similar. Level of digital competence and development during the course was from average to very high in all competence areas. Almost all the respondents have had previous web-based training and it included both web training and classroom training. Most of the respondents agreed that course learning goals were clear, and descriptions of functions were clear but some of them partly disagree. Respondents use of time for studying the course was quite diverse: 2 of them used less than 20 hours, one student used from 20 to 30 hours and two of the students used more than 40 hours. Respondents' suggestions for course length was also quite diverse: from 1 month to over 2,5 months.

Respondents evaluated the course resources benefits, achieving course challenges and level of suitability for teaching use as useful or even very useful. Assessment criteria were clear for two of the respondents and for other respondents they partly agreed or disagreed with the statement as well as with the statement considering teachers feedback helped me to work better during a course.



3.2.7. Suggested improvements

Respondents gave feedback and suggestions in an open question in the final survey but also via email straight to teachers. Students improvement ideas were following:

"I find the layout of the course tasks unclear. Participants were not sufficiently committed. Although the number of participants was large, only a small number of participants have been actively involved. The instructions are somewhat ambiguous as to how to proceed. It is difficult to act when the instructions are not understandable in many ways. "The group always gets inspiration from others and comments on their own output, which was very good. However, in targeted work = at the workplace, similar learning with colleagues is much more effective. There was not enough grouping at the beginning of the course. It would have been good to invest in goal setting somehow. The high-level survey does not correspond to the course, "I learned" to use Moodle with search technology.. The suggestion for development would be good if there was even a final evaluation event where you could hear what someone else might have learned. "The most useful" new thing was maybe the use of Kahoot, I recently got the second position during the activity."

"The course has been intriguingly interesting and the tasks were well explained, but the students were very little active and this affected learning, because without activity, also suggestions and new ideas are not born and this affects learning as a whole process. To understand the interaction was the end of this course the goal, or I do not feel that I have learned what I could have if everything had participated actively. I have appreciated the teacher's explanations and assistance when needed."

"During the course I learned new teaching methods. One of them is ThingLink, which is an excellent tool for compilation: you can compile links, videos, pictures and text. It is very visual and easy to use. ThingLink is an excellent tool for language teaching and provides a good basis for presenting different study paths. I might have wanted more contact lessons. Although many things are easy to do online, the importance of a face-to-face discussion cannot be underestimated. The dynamics of learning are created through interaction. Thank you for the course!"

A few new links have come. A more versatile course structure, clearer instructions and solid guidance would have supported the course. I believe some of the course students gave up the course for these reasons.

3.2.8. Conclusion: final reflection

Module 1 motivated students the most: it gathered most participation among students and returned assignments were produced very creatively. The most challenging part of the course appeared to be online teamwork: between modules 3 and 4 it was difficult to maintain student's motivation, and many gave up with the course even though teachers tried to motivate them to continue via emails and phone calls. Because of the challenges with online teamwork, in the future it would be better if online courses would be possible to study independently, only noticing one's own busy timetable and didn't need to worry about colleagues' timetables too.



Romania

3.3.1. Context

Online training courses have been available to Romanian teachers for the past two decades, but their frequency has been unpredictable, and their content has rarely allowed trainees to build their skills from one course to another in a systematic manner. More recently, some training providers have started maintaining a constant offer of a handful of courses. They are either introductory courses on the use of digital technology and resources or more advanced courses related to the specific products they promote.

The DECODE course was announced during the first half of 2018, when data was collected for the [Practices, training and skills needs of the digital teachers](#) analysis (IO4). Respondents to the questionnaire were invited to express their interest in joining a course designed around their answers. During the last two months of 2018 the course was promoted both towards these teachers, but also towards other groups.

Initially, we had planned to limit the number of participants to 100, but because we received requests far in excess of this number, we decided to take into consideration 350 applications. Of these, 300 teachers took the initial survey and a little over 200 have logged in at least once during the training. 96 participants fulfilled all the criteria for receiving the participation certificate, meaning that the completion rate for those joining the course was above 40%.

3.3.2. Adaptation of the training model for the pilot

The course was almost fully translated into Romanian, the only exception being one of the support materials for the first challenge, which, due to time constraints, was offered only in English. The translated materials were kept as close as possible to the English versions. Only one slide was removed from a support material, as it reflected a different conceptualization of competences from the one promoted during initial teacher training in Romania and we felt it had the potential of creating some confusion.

While the initial plan was to deliver the course over four weeks, we decided that, due to a series of factors (e.g. registration on the platform involved a multi-step process which in some cases require additional support; only a few teachers had previous experience with the Moodle platform; the course was offered right after the winter holidays during a period, when many teachers had to organize student assessment), it would be better to spread the activities over six weeks, with an additional grace period of two weeks. In the end, this pacing seems to have been well balanced, with all participants which had joined a team having had enough time to hand in their assignments.



3.3.3. Sample description

Sociodemographic data

The initial questionnaire was filled in by 300 respondents from 36 counties from Romania, teachers with various specializations, 57% from six counties (BC, B, IS, MS, PH, CT), and 43% from 30 other counties. (Table 1)

Table 1. Distribution by county of the teachers who filled in the initial DECODE questionnaire (300 teachers)

County	No. of teachers (300)	%
Bacău	43	14.3%
București	40	13.3%
Iași	36	12%
Mureș	32	10.6%
Prahova	12	4%
Constanța	9	3%
Bistrița-Năsăud, Neamț, Vâlcea	8	2.6%
Cluj, Dâmbovița, Vrancea	7	2.3%
Buzău, Maramureș	6	2%
Alba, Bihor, Caraș-Severin, Galați, Olt, Suceava, Teleorman	5	1.6%
Argeș, Botoșani, Ilfov, Ialomița	4	1.3%
Brașov, Dolj, Tulcea	3	1%
Mehedinți, Sibiu, Timiș	2	0.6%
Covasna, Hunedoara, Harghita, Satu Mare, Vaslui	1	0.3%
TOTAL	300	



Regarding the distribution of respondents by age, about half of those (46%) who expressed their intention to participate in the training course were aged between 41 and 50 years. The lowest represented age category comprised of teachers aged 19 to 30 (4.7%). (Table 2)

From the point of view of the school level they teach, the most represented were teachers who teach in high school / professional stream (45%), and the lowest representativeness have the pre-school teachers (7%). (Table 2)

Table 2. Distribution by age and by school level (300 teachers)

	Age	No of respondents (300)	%
1	19-30 years	14	4,7%
2	31-40 years	85	28,3%
3	41-50 years	138	46,0%
4	Over 50 years	63	21,0%
		300	100,0%

	School level	No of respondents (300)	%
1	Preschool	21	7,0%
2	Primary	49	16,3%
3	Gymnasium	84	28,0%
4	High school/ professional stream	136	45,3%
	Other	10	3,3%
		300	100,0%

Nevertheless, out of the 300 respondents to the initial questionnaire, only 70 participated into the DECODE course. Who were those 70?

All the 70 people who participated in the DECODE course were teachers out of which half from were from 4 counties (B, IS, MS, BC, NT). Half of the participants belong to the 41-50 age group. The age category with the smallest number of participants was 19-30 years (just 1 participant). 50% of the participants work in high school/ professional stream, while the preschool teachers represented only 7%.

Less than a quarter from the 300 respondents who initially expressed their intention to participate in the course followed their intention and finalized the DECODE course (23,3%). On categories, the percentage of maintaining their initial option increased with age, from 7,1% for teachers aged 19-30 to



36,5% for teachers aged over 50. The initial option was maintained in relatively similar percentages regardless of the school level of the teachers.

Reasons for enrollment

Regarding the reasons for enrollment in the course for the 300 initial respondents, the reason for the improvement of didactic activity was dominant for the majority of the teachers (77%), followed by reasons for training needs on ICT (63.3%), updating / improving the professional skills (62.7%). About half of respondents say they enrolled in the course because they were interested in the subject (54.3%). The need to obtain a diploma (formal certification) and the sharing of experience with other colleagues were expressed by the lowest number of respondents (30% and 34.7%). The percentage of those who enrolled in the course for other reasons (63.3%) is a potential indicator of the diversification of teachers' expectations regarding training programs. (Table 3)

Table 3. Reasons for enrolment (300 and 70 teachers)

No. crt.	Reasons	No of respondents (300)	%	No of participants (70)	%
1	To cover my training need on this theme	190	63,3%	42	60,0%
2	Because I am interested in this subject	163	54,3%	41	58,6%
3	Improvement of didactic activity	231	77,0%	52	74,3%
4	To update my professional knowledge	188	62,7%	49	70,0%
5	To share my experience with other teachers	104	34,7%	32	45,7%
6	To receive a formal diploma/certificate	90	30,0%	27	38,6%
7	Other reasons	190	63,3%	0	0,0%

The reasons for the enrollment of 70 teachers who maintained their option to participate in the course were similar to the reasons expressed by big group of 300 (the improvement of didactic activity was dominant, while the reason for obtaining a diploma (formal certification) was the less mentioned criterion). Nevertheless, the 70 participants did not choose the Other reasons option, unlike the big



group of 300 who massively turned to this option. It could be a potential indicator of more specific expectations and interests of the real participants in comparison to the group of teachers who only expressed their intention to participate. (Table 3)

Accreditation of the ICT competence level

Out of the 300 respondents, 24% said they had a form of digital competency certification at the time of completing the initial questionnaire. Out of those who declared that they acquired a form of certification, the highest percentage belongs to teachers over 50 (30.2%). The age categories that declared in the lowest percentages that they have digital competences certifications were primary and preschool teachers, only 12% respectively 14% of them declaring that they were certified.

Unlike certified competencies, online learning experiences attended by the 300 teachers were more numerous: 65.3% said they were involved in this type of learning prior the DECODE course. Out of those who participated in online training experiences, teachers over 50 declared the highest percentage of participation in such activities prior to enrolling in the course (73%). Young teachers (19-30 years) declared the lowest percentage of participation in such activities (35.7%).

From the point of view of school level (300), out of those who declared that they acquired a formal certification and/or participated in online learning experiences, high school/ professional stream teachers declare in the highest percentage compared to colleagues from other school levels that they have both digital competency certification (33.8%) and participation in online learning experiences (69%).

Table 4. Certification level and participation in online learning experience by age and school level (300 teachers)

		Respondents	Certification		Online learning experiences	
Total	Total	300	73	24,3%	196	65,3%
Age	19-30 years	14	2	14,3%	5	35,7%
	31-40 years	85	11	12,9%	47	55,3%
	41-50 years	138	41	29,7%	98	71,0%
	Over 50	63	19	30,2%	46	73,0%
School level	Pre-primary	21	3	14,3%	11	52,4%
	PRI	49	6	12,2%	32	65,3%



	GIM	84	17	20,2%	52	61,9%
	LIC/PRF	136	46	33,8%	94	69,1%
	AIT	10	1	10,0%	7	70,0%

Related to the group of 70 teachers who participated in the course, higher percentage of teachers from the group of 70 declared that they have participated in online learning experiences than those from the initial group of 300 (80% in comparison with 65%), while a higher percentage from the group of 70 declared that they have certified their ICT competences than those from the initial group of 300 (30% in comparison with 24,3%) (Table 5). One possible interpretation of this fact can be that teachers who decided to participate in the course were those who have been previously accustomed with online learning experiences and who were a little bit more interested to receive certification for their learning outcomes.

Table 5. Certification level and participation in online learning experience by age and school level (70 teachers)

		Respondents	Certification		Online learning experiences	
Total	Total	70	21	30,0%	56	80,0%
Age	19-30 years	1	0	0,0%	1	100,0%
	31-40 years	13	1	7,7%	11	84,6%
	41-50 years	33	12	36,4%	28	84,8%
	Over 50	23	8	34,8%	16	69,6%
School level	Pre Primary	5	0	0,0%	4	80,0%
	PRI	11	0	0,0%	8	72,7%
	GIM	19	5	26,3%	15	78,9%
	LIC/PRF	35	16	45,7%	29	82,9%
	AIT	5	0	0,0%	4	80,0%

Evaluation of the ICT maturity of the school



At the end of the DECODE course, 70 Romanian participating teachers were asked to evaluate the ICT maturity of the school. Respondents appreciated the technological infrastructure, the digital competencies of the teachers and the digital competencies of the pupils a little bit over average related to maturity (around 63%). Only small percentages (between 5 and 11%) consider the school either very little mature or very mature for all three analyzed dimensions. (Table 12).

Table 12. The evaluation of the ICT maturity level of the school

	1 (very little mature)	2	3	4	5	6 (very mature)	
Technological infrastructure	8.6%	8.6%	21.4%	30%	20%	11.4%	63.1%
Digital competencies of the teachers	5.7%	8.6%	22.9%	31.4%	24.3%	7.1%	63.6%
Digital competencies of the pupils	5.7%	5.7%	24.3%	35.7%	22.9%	5.7%	63.6%

3.3.4. Perception about the level of Digital Competencies

Regarding the self-assessment of the level of digital competences of the initial 300 teachers who responded to the initial questionnaire, namely the "ability to access and transfer knowledge, strategies, skills and attitudes related to ICT in real-life situations in professional practice" (Teachers' Digital Competence in Catalonia), young teachers aged under 40 believe that they have 80% of the necessary digital skills and the percentage decreases to 60% for those aged between 31 and 40 years.

For the 300 teachers, high levels of development of specific digital competences (68%) are recorded in the field of communication with colleagues (in the virtual space), in the field of searching and selecting resources for the activity with pupils (67.2%) and in the field of digital identity management in online (64.8%). The lowest levels of development of specific digital competences are recorded in the field of student assessment (57.2%), in the field of application of innovative methodologies with digital support (57.6%) and in the field of activation of a digital profile (57.8%). (Table 6)

Table 6. Level of development of specific digital competences (300 teachers)

Types of assessed digital competencies	Competencies development level
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Digital technology used in communication with peers	68%
Searching and critical selection of proper resources for the context and the specific learning objectives	67.2%
Awareness and management of own digital identity in online interactions	64.8%
Using digital technologies in designing activities or learning situation	63.5%
Respecting licenses for the use of digital resources	62.5%
Appropriate application of media and digital environment rules (content, language, correct management)	61.7%
Active participation in educational networks through digital environments	61.1%
Reflective practice on the professional use of digital technologies	60.3%
Incorporating students' digital competences into educational activity	59.1%
Optimizing digital information management	59.1%
Facilitate working together in building knowledge through digital technologies	58.5%
Activate a professional digital profile in different networks and in your own educational context	57.8%
Using innovative methodologies through digital technologies	57.6%
Defining the monitoring and assessment strategy of pupils in the teaching-learning process (self assessment, peer assessment)	57.2%

In the original group of 300 teachers, those between 19 and 30 years of age declare the highest level of development (74.3%) in the search and critical selection of resources among all the other competences held, but also compared to all other age categories. Also, young teachers (19-30 years) declare higher levels of development than other age categories in 8 of the 14 digital competences. Young teachers declare the lowest level of competence in respecting digital rights licenses (55%) and pupils' assessment (57%) of both all their skills and all age categories. Teachers over 50 declare that they have the highest level of virtual environment communication competence with peers (70.8%), both of all types of competences they own and of all other age groups. They also declare the highest levels of development in 6 out of 14 highlighted digital competences, relative to other age categories. Students' assessment with digital support competencies have the lowest level of development (based on self-assessment), both in comparison with all the other competencies surveyed, as well as for all age groups (with the lowest degree of possession among teachers aged between 31 and 40 years - 56%).

Table 7. Specific digital competences level of development linked to the age levels (300 teachers)



Types of self-assessment digital competences	Competencies level of development			
	19-30 years	31-40 years	41-50 years	Over 50 years
Digital technology used in communication with peers	70%	68.2%	66.4%	70.8%
Searching and critical selection of proper resources for the context and the specific learning objectives	74.3%	65%	56.7%	60.7%
Awareness and management of own digital identity in online interactions	62.9%	59.5%	60.4%	60.6%
Using digital technologies in designing activities or learning situation	62.9%	61.9%	63.9%	65.1%
Respecting licenses for the use of digital resources	55.7%	58.8%	63.7%	67.6%
Appropriate application of media and digital environment rules (content, language, correct management)	65,7%	60,7%	62,2%	61,3%
Active participation in educational networks through digital environments	62.9%	59.8%	60.7%	63.5%
Reflective practice on the professional use of digital technologies	62.9%	59.5%	60.4%	60.6%
Incorporating students' digital competences into educational activity	61.4%	56.7%	59.9%	60%
Optimizing digital information management	61.4%	59.1%	59.6%	57.8%
Facilitate working together in building knowledge through digital technologies	61.4%	58.1%	58.0%	59.7%
Activate a professional digital profile in different networks and in your own educational context	65.7%	58.1%	56.7%	58.1%
Using innovative methodologies through digital technologies	62.9%	61.8%	63.9%	65.1%
Defining the monitoring and assessment strategy of pupils in the teaching-learning process (self assessment, peer assessment)	57.1%	56.0%	57.5%	58.1%

From the point of view of digital competencies that the 300 teachers have according to the school level, primary school teachers declare that they have the highest levels of development of 13 out of the 14 listed competencies compared to peers at other school levels, with higher degree of ability in the use of



digital technologies in communication with peers (74.4%), both of all their competences and of all the school levels investigated. (Table 8).

The lowest levels of development of self-assessed digital competences are recorded among pre-school teachers compared to teachers at other levels of teaching (8 out of 14 highlighted skills), with the lowest level of competencies in terms of incorporating of digital competences of pupils in educational activities (52.4%). (Table 8).

Teachers from high school / professional stream also declare, like teachers from the other school levels, that they have the highest levels of competencies development in the use of digital technologies in communication with peers (6.2%). Compared to teachers from other school levels, they say that they have a higher degree of competencies to incorporate the digital competencies of the pupils in their educational activities (61,2%, compared to 52,4%, 57,1% and 60,4% of the teachers at the other levels teaching). (Table 8).

Table 8. Digital competences development level linked to the level of teaching (300 teachers)

Self-assessment of digital competences	Competencies level of development			
	Preschool	Primary	Gymnasium	High school/ professional stream
Digital technology used in communication with peers	63,8%	74,7%	66,0%	68,2%
Searching and critical selection of proper resources for the context and the specific learning objectives	65,7%	69,8%	65,5%	67,8%
Awareness and management of own digital identity in online interactions	61,9%	68,2%	62,6%	65,9%
Using digital technologies in designing activities or learning situation	60,0%	66,5%	61,0%	65,0%
Respecting licenses for the use of digital resources	58,1%	66,1%	60,5%	64,0%
Appropriate application of media and digital environment rules (content, language, correct management)	56,2%	63,7%	61,7%	62,5%
Active participation in educational networks through digital environments	61,0%	66,9%	57,6%	61,6%
Reflective practice on the professional use of digital technologies	56,2%	62,9%	57,1%	62,2%
Incorporating students' digital competences into	52,4%	60,4%	57,1%	61,2%



educational activity				
Optimizing digital information management	54,3%	62,4%	58,1%	59,4%
Facilitate working together in building knowledge through digital technologies	58,1%	61,6%	55,5%	59,7%
Activate a professional digital profile in different networks and in your own educational context	56,2%	63,3%	55,5%	57,9%
Using innovative methodologies through digital technologies	54,3%	60,0%	55,0%	56,0%
Defining the monitoring and assessment strategy of pupils in the teaching-learning process (self assessment, peer assessment)	56,2%	59,2%	56,0%	57,8%

After the finalization of the DECODE course, the 70 teachers who participated had to re-evaluate their level of competencies. There is a certain level of improvement for all competencies and for all categories, with teachers declaring that they had 68,3% of the necessary digital skills before the course and 77,1% after the course. (Table 9)

Table 9. Comparison between the self-assessed level of competencies at the beginning and at the end of the DECODE course, by age (70 teachers)

			Distribution of the subjects on estimated levels					Medium evaluated level
		Total subjects	Very low	Low	Medium	High	Very high	
			1	2	3	4	5	
		Initial self-evaluation of the competencies level						
	Total	70	0	2	43	19	6	
Total	Total	70	0,0%	2,9%	61,4%	27,1%	8,6%	68,3%
Age	19-40 years	14	0,0%	0,0%	78,6%	14,3%	7,1%	65,7%
	41-50 years	33	0,0%	3,0%	54,5%	36,4%	6,1%	69,1%
	Over 50 years	23	0,0%	4,3%	60,9%	21,7%	13,0%	68,7%
			Final self-evaluation of the competencies level					
		70	0	2	43	19	6	



Total	Total	70	0,0%	1,4%	31,4%	47,1%	20,0%	77,1%
Age	19-40 years	14	0,0%	0,0%	21,4%	50,0%	28,6%	81,4%
	41-50 years	33	0,0%	0,0%	27,3%	54,5%	18,2%	78,2%
	Over 50 years	23	0,0%	4,3%	43,5%	34,8%	17,4%	73,0%

By both age and school level, before the course a higher percentage of teachers self-evaluated their level of competencies at the medium level, while at the end of the course a higher percentage of teachers from all categories self-evaluated their competencies as high and very high. Young teachers (19-40 years), are the only age group who self-evaluated the initial competencies below the medium evaluated level of the whole group (65,7% in comparison to 68,3%), at the end of the course declared the level of competencies above the medium evaluated level of the whole group (81,4% in comparison with 77,1%). (Table 9). High school teachers, the only group who self-evaluated the initial competencies above the medium evaluated level of the whole group (71,4% in comparison to 68,3%), declared at the end of the course level of competencies above the medium evaluated level of the whole group. (Table 10).

Table 10. Comparison between the self assessed level of competencies at the beginning and at the end of the DECODE course, by school level (70 teachers)

			Distribution of the subjects on estimated levels					Medium evaluated level
		Total subject s	Very low	Low	Medium	High	Very high	
			1	2	3	4	5	
		Initial self-evaluation of the competencies level						
	Total subjects	70	0	2	43	19	6	
Total	Total	70	0,0%	2,9%	61,4%	27,1%	8,6%	68,3%
School level	Preschool	5	0,0%	20%	80,0%	0,0%	0,0%	56,0%
	Primary	11	0,0%	0,0%	63,6%	36,4%	0,0%	67,3%
	Gymnasium	19	0,0%	0,0%	68,4%	31,6%	0,0%	66,3%
	High school/	35	0,0%	2,9%	54,3%	25,7%	17,1%	71,4%



	professional stream							
			Final self-evaluation of the competencies level					
		70	0	2	43	19	6	
Total	Total	70	0,0%	1,4%	31,4%	47,1%	20,0%	77,1%
School level	GRD	5	0,0%	20%	20,0%	60,0%	0,0%	68,0%
	PRI	11	0,0%	0,0%	36,4%	27,3%	36,4%	80,0%
	GIM	19	0,0%	0,0%	42,1%	36,8%	21,1%	75,8%
	LIC/PRF	35	0,0%	0,0%	25,7%	57,1%	17,1%	78,3%

For the 70 teachers who participated in the DECODE course, the specific competencies self-evaluated in the highest percentage at the beginning of the course are using digital technology used in communication with peers (70,9%), searching and critical selection of proper resources for the context and the specific learning objectives (68,6%) and awareness and management of own digital identity in online interactions (68%). The lowest percentage can be seen for the competencies of using innovative methodologies through digital technologies (60%) and defining the monitoring and assessment strategy of pupils in the teaching-learning process (60,3%). (Table 11).

At the end of the course, the highest percentage related to the level of the competencies development was declared for the same competency as in the beginning of the course: using digital technology used in communication with peers (79,1%, with an increase of 8,2%), Even if the level of the competencies increased with 12,9% in comparison with the initial self-evaluation, the lowest percentage remained for using innovative methodologies through digital technologies (72,9%). (Table 11).

For all competencies there is evidence of an increase in the level of development at the final evaluation moment in comparison with the initial self-evaluated level, with the highest increase for the competencies related to the facilitation of working together in building knowledge through digital technologies (14,6%) and defining the monitoring and assessment strategy of pupils in the teaching-learning process (14%) and the lowest increase for awareness and management of own digital identity in online interactions (6,3%) and searching and critical selection of proper resources for the context and the specific learning objectives (6,8%).

Table 11. Comparison between the initial -final self-evaluated level of competencies (Z-test)

	Initial level	Final level	Difference Z-Test
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Using digital technologies in designing activities or learning situation	67,4%	76,3%	8,9%	1,18
Using innovative methodologies through digital technologies	60,0%	72,9%	12,9%	1,63
Defining the monitoring and assessment strategy of pupils in the teaching-learning process (self-assessment, peer assessment)	60,3%	74,3%	14,0%	1,79
Searching and critical selection of proper resources for the context and the specific learning objectives	68,6%	75,4%	6,8%	0,90
Incorporating students' digital competences into educational activity	62,3%	75,4%	13,1%	1,69
Appropriate application of media and digital environment rules (content, language, correct management)	65,4%	76,0%	10,6%	1,39
Optimizing digital information management	61,1%	74,6%	13,5%	1,73
Digital technology used in communication with peers	70,9%	79,1%	8,2%	1,13
Active participation in educational networks through digital environments	65,1%	75,1%	10,0%	1,30
Facilitate working together in building knowledge through digital technologies	61,7%	76,3%	14,6%	1,89
Respecting licenses for the use of digital resources	66,6%	75,4%	8,8%	1,15
Awareness and management of own digital identity in online interactions	68,0%	74,3%	6,3%	0,82
Reflective practice on the professional use of digital technologies	64,3%	74,9%	10,6%	1,37
Activate a professional digital profile in different networks and in your own educational context	62,3%	74,3%	12,0%	1,54

Even if all values in the declared level of competencies increased (the self-evaluated level of all competencies has been improved in the final self-evaluation in comparison with the initial evaluation), there is no significant difference ($Z\text{-test} < 1,96$). In other words, even if at the end of the course higher levels of competencies development can be seen in comparison with the initial declared level, the data we have cannot reject the null hypothesis (the null hypothesis states that there are no differences between the two groups OR the course does not produce effects). It is probable that the differences obtained were accidental.



3.3.5. Course evaluation - organization and development

- In almost total percentage, the participants who completed the course stated that this course managed to stimulate their interest.
- The clarity and accuracy of the communication seems to have been the strength of the course, considering that for almost 90% of the participants, the course objectives and the evaluation criteria were clear from the start, 99% consider that the tutor's instructions were clear, and 94% felt that the description of the activities were also clear.
- Although less than 60% of respondents believe that the role of tutors was a key element of the course, 90% and above agree that the feedback received from the tutors and their communication helped them to improve and organize the work of the course.
- A lower percentage think that the challenge-based approach helped to achieve the course objectives.
- In relation to the final goal of the course, 80% and above believe that online collaborative work helped them to develop their digital didactic skills and that this course has helped them become aware of the digital competences of teachers.
- 77% intend to continue training in the digital competencies of teachers.
- Although almost all participants who have completed the course would recommend it to colleagues, only half are considering disseminating the experience of the course among colleagues in their school / institution.

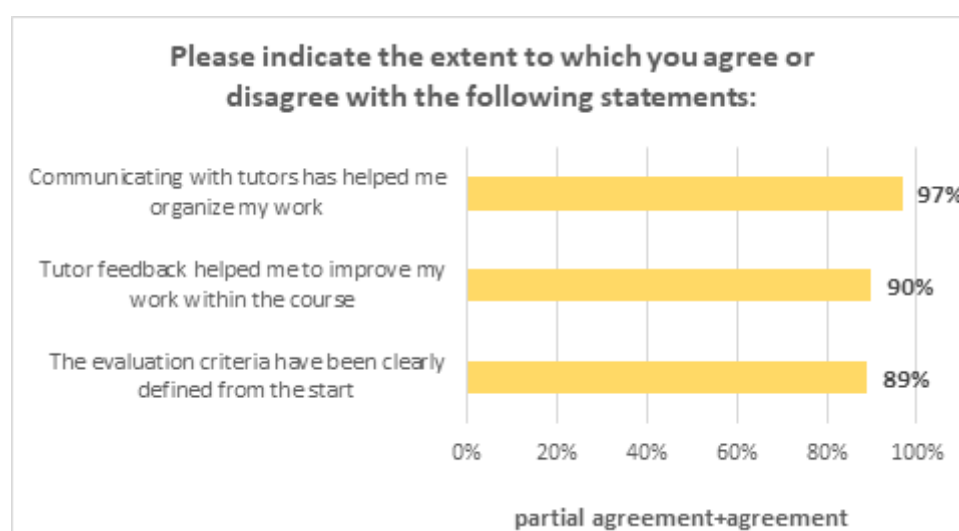


Figure 1. Evaluation of the course (1)

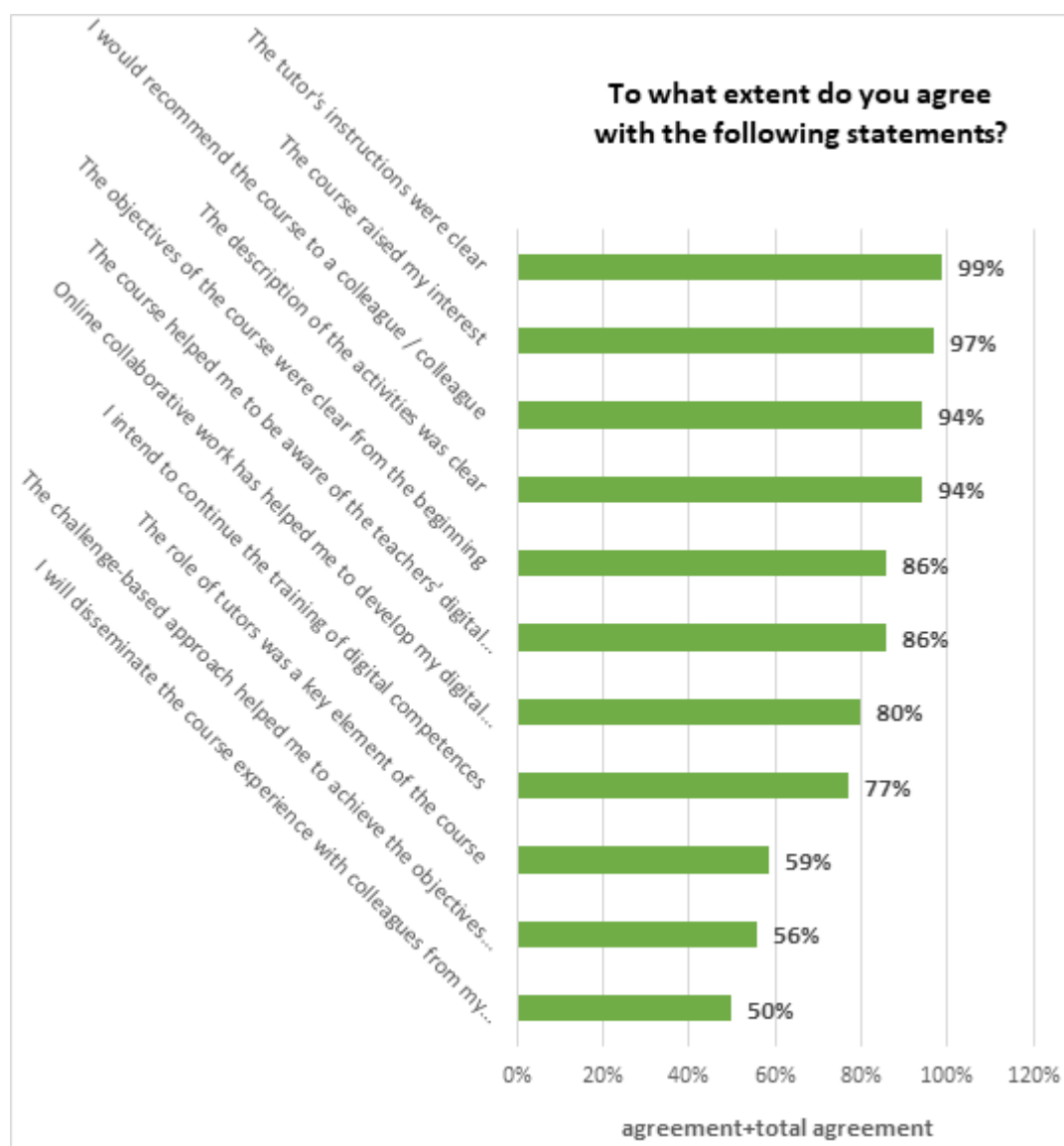


Figure 2. Evaluation of the course (2)

Intensity of participation

- More than half of the participants who completed the course reported a reduced attendance intensity, allocating less than 20 hours for their activities.
- Nearly a quarter of the trainees who had passed the evaluation had an average intensity of involvement in the course between 30-40 hours, while the participants with the most intense activity, over 40 hours allocated to the course, recorded a lower percentage.

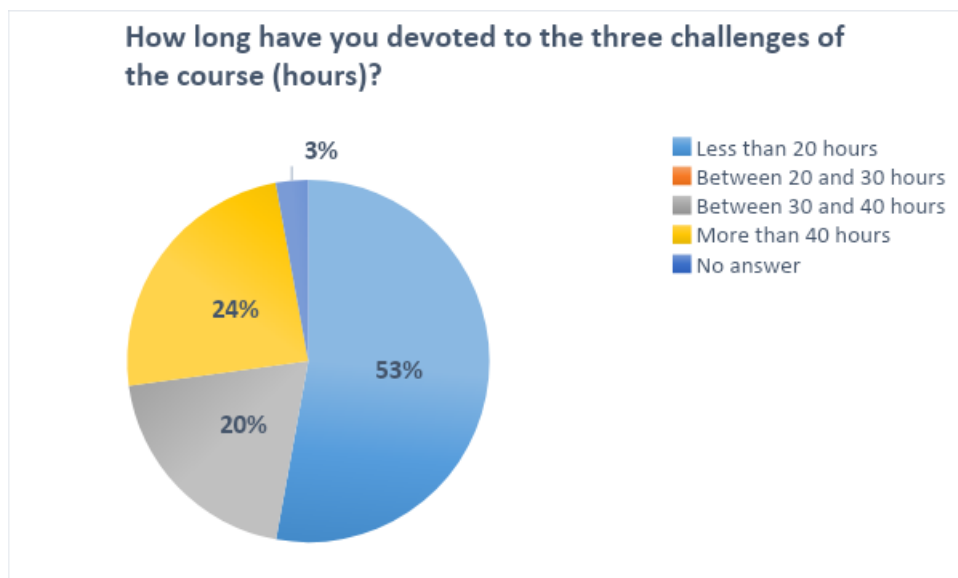


Figure 3. Time allocated for the course

- Taking into account the estimates of the participants who have completed the course of its ideal duration, we can say that the actual stretch of about one month was appropriate for most of the participants.
- However, about a quarter of the participants find it more appropriate for this course to have a wider duration of at least one month, half, two months or even longer than two and a half months.

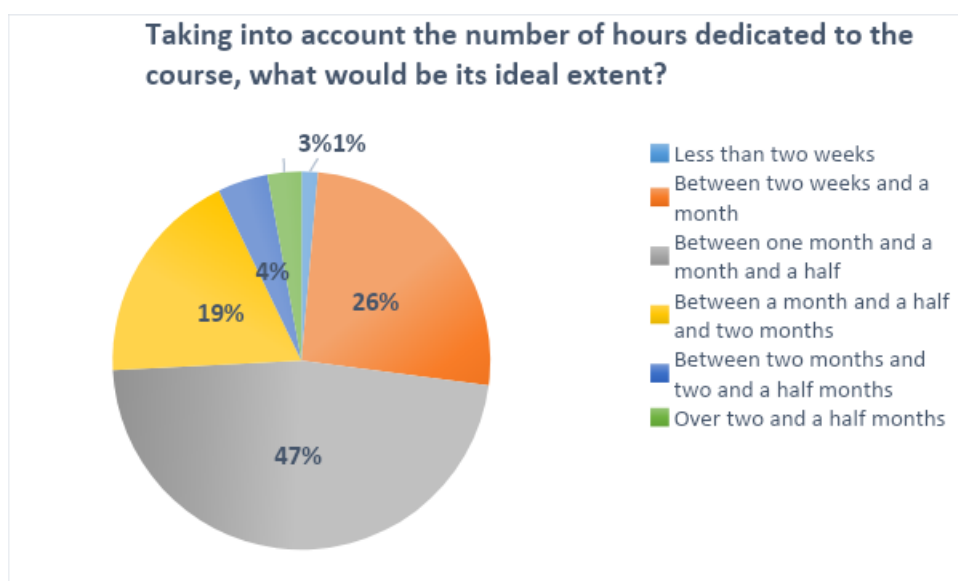


Figure 5. Ideal time for the course



Evaluation of resources in the course

- High and very high percentages of participants who attended the course stated that they had consulted the materials at their disposal.
- A hierarchy of interest shown by participants in the course's support materials shows that the most consulted resources were about Digital Communication and Collaboration, ICT use in education, and the Design of learning situations.

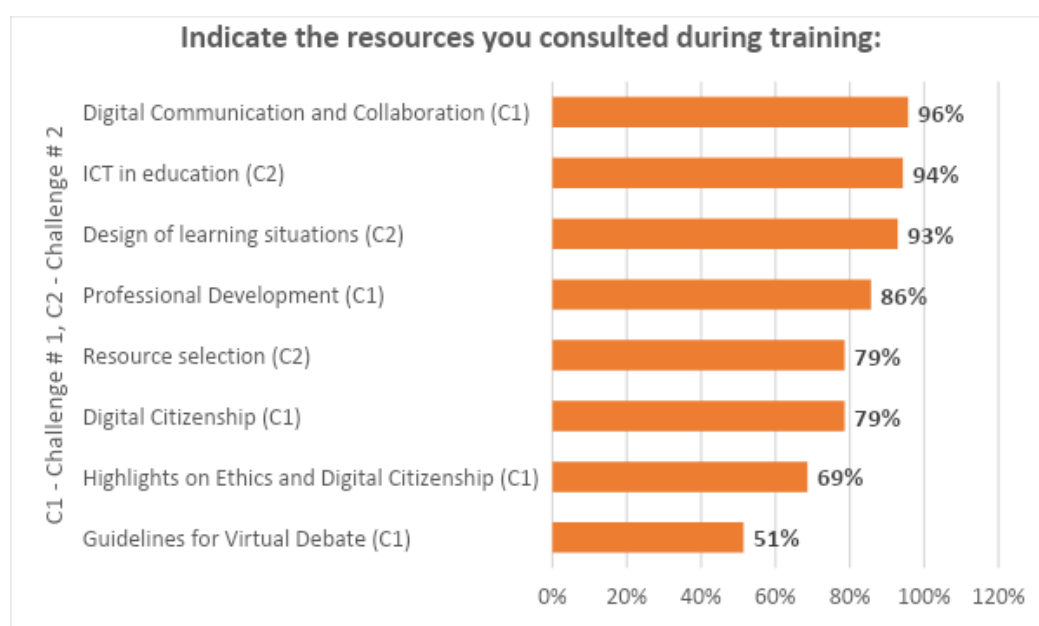


Figure 6. Resources consulted during the course

- Of the eight support materials available, the use of ICT in education was greatly appreciated, both in terms of its usefulness in addressing the challenges of the course and its applicability in the current didactic work.
- While viewed and appreciated by the vast majority of learners, Resources on Learning Design and Communication and Digital Collaboration were evaluated as being more useful in the course's activities than in the current teaching activity.
- Digital Citizenship Resources and Virtual Discussion Guidelines were the materials least consulted and were also more appreciated for their utility in solving course tasks and less for their relevance to the current didactic activity.

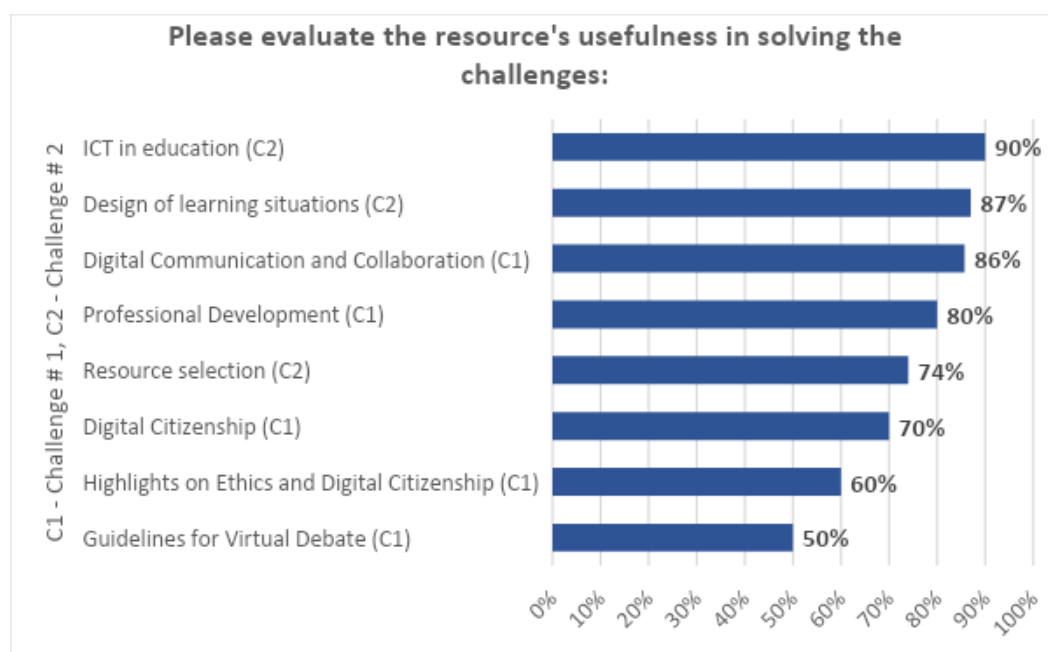


Figure 7. Evaluation of the usefulness of the resources

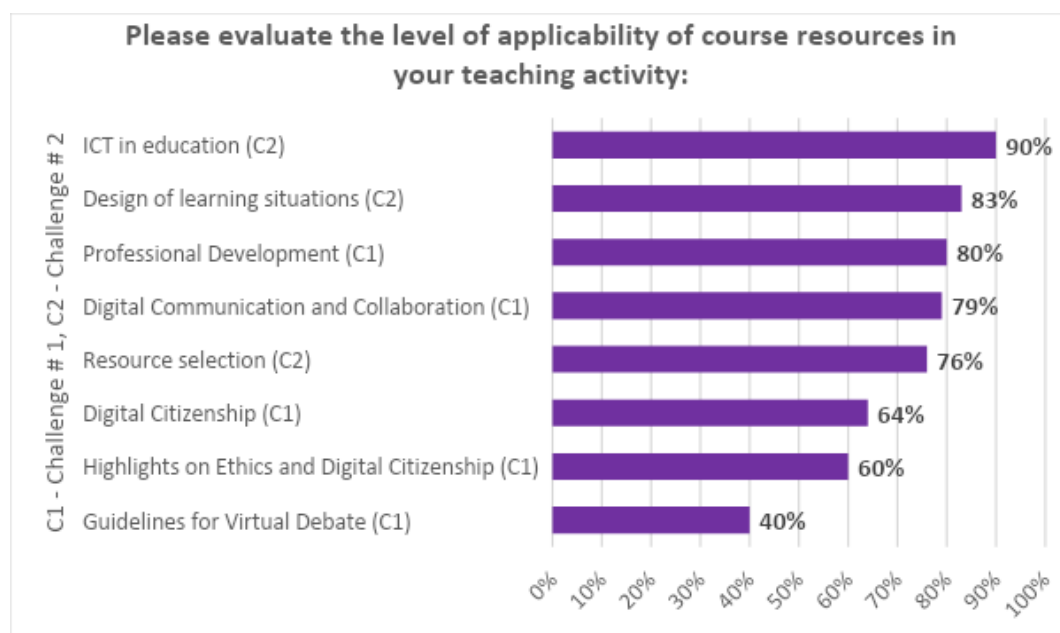


Figure 8. Evaluation of the level of applicability of the course resources



3.3.6. *Suggestions for improvement from participants*

Some of the criticism of the course regarded technical aspects such as the design of the platform that raises issues in allowing real-time communication with colleagues and for some participants the site seemed difficult to access.

Other problematic aspects were the level of involvement in activities from group members in meeting deadlines and the criteria for creating the groups (based on the common interests related to both the subject discipline, the continuing vocational training, the learning cycle in which each of them work and curricular area - would have resulted in much greater interaction within the formed groups).

Another issue that was raised was the time and duration of the course, considering that some participants would have wanted a longer period and others a lesser course duration, during school holidays.

Other requests from participants involved translating all the support resources into Romanian, and a score evaluation at the end of each activity.

Some participants suggested including : a training session of the students filmed and then access to the platform as an example of good practice; creating a tutorial in PowerPoint, with picture based instructions, about the content of the course; creating a YouTube channel in which tutors explain, in their own voice, the fundamental notions during the course

3.3.7. *Conclusions*

The initial interest questionnaire was filled in by 300 teachers from 36 counties from Romania. Out of them, less than a quarter (70 teachers) followed through with their intention, registered and finalized the DECODE course (23,3%). The percentage of teachers maintaining their initial option increased with age, from 7,1% for teachers aged 19-30 to 36,5% for teachers aged over 50. The initial option was maintained in relatively similar percentages regardless of the school level of the teachers.

Below are the sociodemographic characteristics of the group of 70 teachers enrolled in the course:

- half of them are from 4 counties (B, IS, MS, BC, NT);
- half of them belong to the 41-50 age group;
- the age category with the smallest number of participants was 19-30 years (just 1 participant);



- 50% of the participants work in high school/ professional stream, while the preschool teachers represented only 7%.

The reasons for enrolment of 70 teachers who maintained their option to participate in the course were similar to the reasons expressed by the big group of 300 (the improvement of didactic activity was dominant, while the reason for obtaining a diploma (formal certification) was the less mentioned criterion).

Regarding the accreditation of ICT competencies, over three quarters of the 70 teachers who participated in the DECODE course declared that they have participated in online learning experiences (80%) and only one third declared that they have certified their ICT competences (30%). As far as the formal certification is concerned, by age, teachers 31-40 years declare the lowest percentage (7,7%), while by school level, teachers from primary school declare not having any kind of certification. Related to online learning experiences, by age, teachers over 50 declared the lowest percentage of participation (69,6%) while by school level, teachers from high school/ professional stream had the highest participation from all other school level categories (82,9%).

Respondents evaluated the ICT maturity of the school and results show a perceived maturity a little bit over the average level (63%) for all 3 dimensions evaluated (the technological infrastructure, the digital competencies of the teachers and the digital competencies of the pupils). Only small percentages (between 5 and 11%) consider the school either very little mature or very mature for all three analysed dimensions.

The 70 teachers self-evaluated themselves on 14 specific competencies before and at the end of the course. For all competencies an increase in the level of development at the final evaluation moment in comparison with the initial self-evaluated level can be observed (77,1% in comparison with 68,3% at the beginning of the course), with the highest increase for the competencies related to the facilitation of working together in building knowledge through digital technologies (14,6%) and defining the monitoring and assessment strategy of pupils in the teaching-learning process (14%) and the lowest increase for awareness and management of own digital identity in online interactions (6,3%) and searching and critical selection of proper resources for the context and the specific learning objectives (6,8%). Nevertheless, even if all values in the declared level of competencies increased (the self-evaluated level of all competencies has been improved in the final self-evaluation in comparison with the initial evaluation), there is no significant difference ($Z\text{-test} < 1,96$). In other words, even if at the end of the course higher levels of competencies development can be seen in comparison with the initial declared level, the data we have cannot reject/confirm the null hypothesis (the null hypothesis states that there are no differences between the two groups OR the course does not produce effects.). It is probable that the differences obtained are accidental.

A very high percentage of participants who have completed the course positively appreciated the organization and course development, the most appreciated aspect being the clarity and accuracy of the communication regarding the objectives of the course, the evaluation criteria, the instructions received from the tutors and the description of the activities. Also, for the majority of participants, the



duration of the course was optimal, but a significant part would have wanted the course to take place over a longer period.

As far as the final objective of the course is concerned - the development of learners' digital competences - they believe it has been achieved, but over 40% of learners think that the challenge-based approach was not effective in meeting the course objectives.

Regarding the intensity of participation, the vast majority of students have allocated less than 20 hours per week of coursework, with a reduced attendance intensity.

High percentages of participants consulted the support materials, the most consulted resources being the ones about Digital Communication and Collaboration, ICT use in education, and the Design of learning situations. Of the eight support materials available, The use of ICT in education has been greatly appreciated, both in terms of its usefulness in addressing the challenges of the course and its applicability in the current didactic work.

3.4 Italy

3.4.1. Context

The training course was proposed to school teachers of every order and grade contacted through formal and informal channels. The Italian partners (FLCU, Roma TRE University and ANP) mainly used their own databases to reach teachers through the sending of dedicated emails. Communication and engagement channels were also the project website, IO4 participants who expressed their interest in the training initiative and the Facebook Decode page. The teachers received an official letter signed by the scientific director of the project and the Head of international relations of the *Italian Association for school heads and teachers* (ANP). In the letter the project and the specific objectives of the training seminar were briefly presented. The syllabus was also attached to the communication for a more detailed description of the times, methodologies and contents of the training. Finally, the registration link to the e-learning Moodle platform that hosted the training course was attached. In addition, participants were reminded about the need of quality in their products. In this regard, following a peer review, the participants in the course chose 5 learning situations that were better according to a score from 1 to 4 (1 = not at all 2 = little 3 = very 4 = very much) assigned to three main indicators:

- a) clarity of objectives, contents and methodology;
- b) educational effectiveness: quality of the relationship between the expected products and the identified objectives; ability to be able to achieve the goals set through the proposed activities; innovativeness of the method and tools used;
- c) transferability or replicability of the training, considering the constraints of the context.



The best learning situations of the course will be summarised in the final project publication. All the learning situations will be published in full on the project website.

The other partners were also invited to share their best learning situations with the aim of offering an international and diversified experience.

3.4.2. *Adaptation of the training model for the pilot*

The course started on December 17th and ended on March 27th 2019 with the administration of the final questionnaire, for a total duration of about three and a half months. The seminar recorded the initial interest of 161 teachers, registered on the platform within a single week, against a target of 50 members. Due to this result, the entries were closed early. Of these 43 (27%) completed the entire course. Among those who completed the course, 35 teachers responded to both the initial and final monitoring questionnaire.

The high drop outs, linked to various factors, is mainly motivated by the difficulty of teachers to reconcile their training with the numerous commitments and activities in which they are involved at school. The need to reconcile teaching and training times has involved an ongoing review of the time dedicated to training activities, extending the course to the end of March. In this regard, we noted that the first phase of the training was that which required more time and a strong investment in individual tutoring actions to hire teachers, reduce drop-outs and train work groups. This is in line with the high drop-out rates that characterizes the MOOC courses: among those who subscribe to a MOOC only 10-15% successfully complete training (Parr 2013; Chen & Zhang 2017).

The high interest aroused by the seminar also made it necessary to create five virtual space (DECODE ITALY 1, n) where the various training activities were structured as indicated by the lead partners of the IO5 (UOC). At the end of the third phase the Italian partnership considered it appropriate to create another space dedicated to the review of Learning Situations, given the smaller number of teachers who reached the end of the path (43). Finally, in the space dedicated to the evaluation, a last section was added for the *peer evaluation* of the Learning Situations reviewed by each team after collecting the comments of the reviewers. The evaluation indicators are those already described in the previous paragraph (§ 1).

The peer review and the proposed publication of the best Learning Situations were received with great enthusiasm and participation. The schools belonging to all the members of the teams that were winners in the outcome of the peer evaluation received this communication indicating the mention of the teacher and the institute. Also, this initiative was favorably received by the teachers and by the school managers who received the communication.

3.4.3. *Sample description*

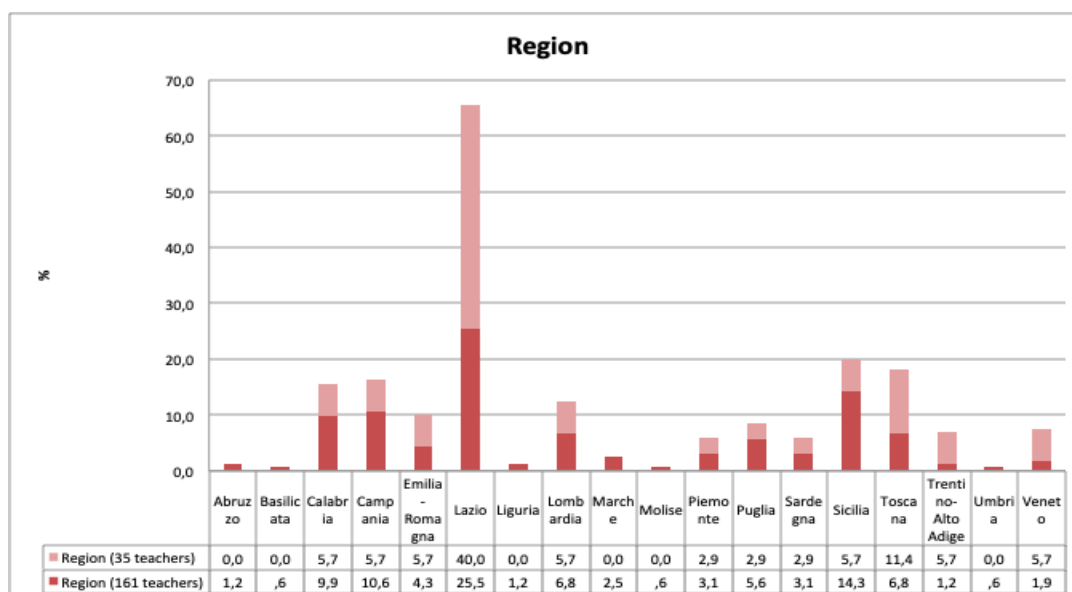
The initial questionnaire was filled in by 161 teachers that enrolled in the platform and a total of 43 completed the course. 35 of the teachers that completed the course, completed the initial survey but



only 8 of them completed the final survey. In our analysis we have reported both the data relating to the 161 teachers enrolled on the platform and those of the 35 teachers who have completed the training.

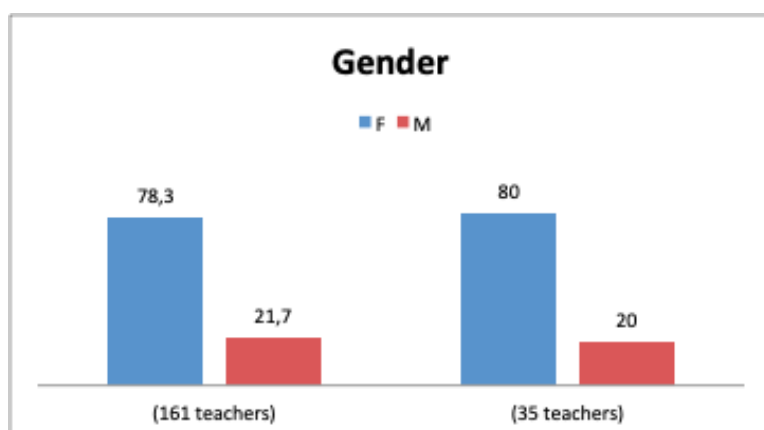
Sociodemographic data

Chart 1 Distribution by region of the teachers



The majority of 161 teachers reached by the survey comes from Lazio (25,5%) and from regions in South Italy (41,6%). Only a low number of them comes from the North (14,9%) and from the Centre (15,4%). The total percentage of 35 teachers who participated in course confirmed the data of 161, in fact 40% of them comes from Lazio (40%). The sample, although not statistically representative, reflects the Italian teaching population in terms of gender and age.

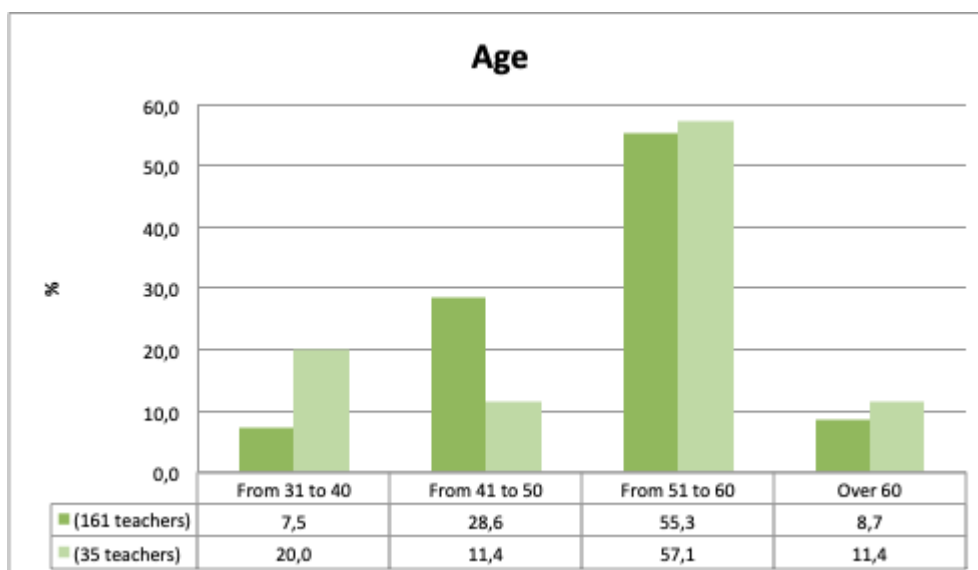
Chart 2 Gender





Considering the participants' gender, female teachers are more numerous: 78,3% (161) and 80% (35)

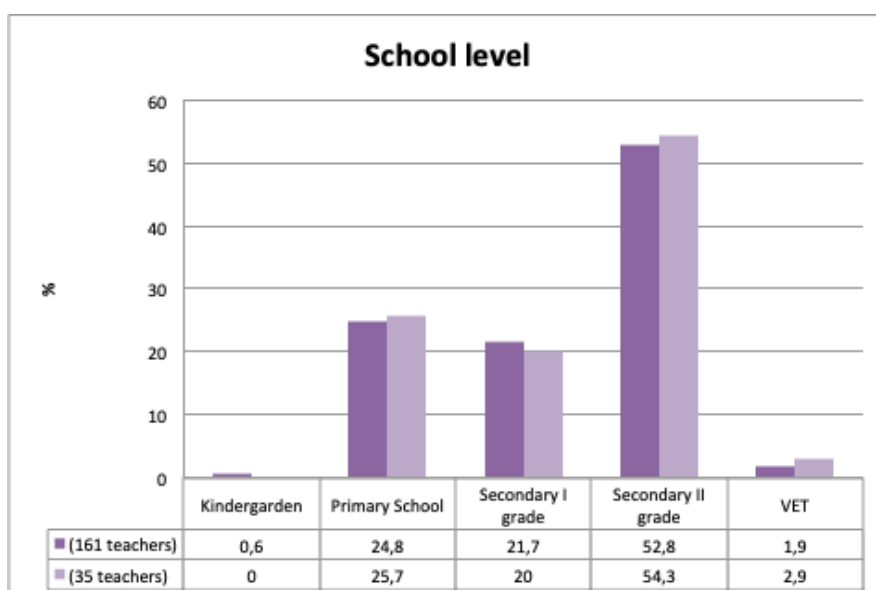
Chart 3 Age



It is interesting that among those who completed the course the age range between 31 and 40 years old is well represented (20%). Instead, a high percentage of drop-out, for both the groups interviewed is represented by the range of 41-50 (28,6% 161 teachers; 11,4% ref. to 35 teachers)

A high percentage is represented by the range of 51-60 (55,3% 161 teachers and 57,1% ref. to 35): this reflects the profile of teachers involved in the general survey, which we can define as “digital immigrant” and which is particularly sensitive to training for the improvement of its digital competences.

Chart 4 School level





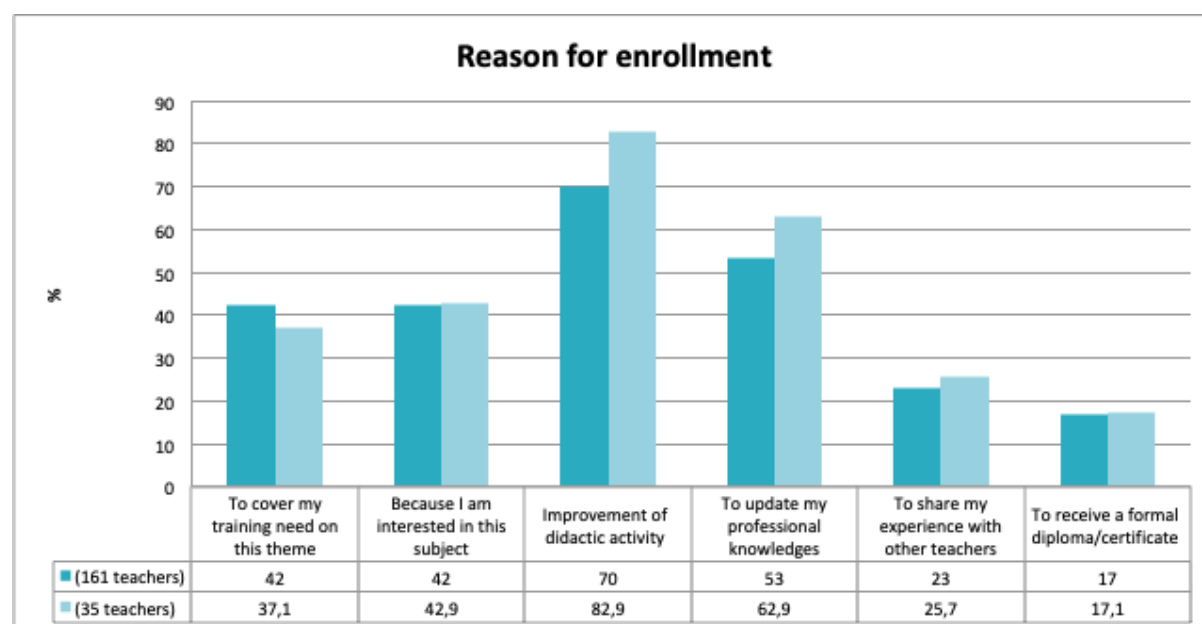
Most participants, for both of the groups (52,8% of 161; 54,3% of 35) teaching at the Secondary II grade school. The data confirms the most frequent use of ICT in high school orders, as confirmed by the results of the [DECODE survey](#). None of the 35 come from Kindergarten (0%) and only 2,9% from VET.

Similar percentages are seen for the 161 teachers: 0,6% from Kindergarten and 2,9% from VET.

Reasons for enrolment

The reasons for enrolment of the 35 teachers who maintained their option to participate in the course were similar to the reasons expressed by the big group of 161: the improvement of didactic activity was dominant (70% for 161 and 82,9% for 35), while the reason for obtaining a diploma (formal certification) was the less mentioned criterion (17% for both groups). (Table 1)

Chart 5 Reason for enrolment



Accreditation of the ICT competence level

Out of the 161 respondents, 47,8% said they have achieved an ECDL certification. The % of those who have the ECDL certification among the 35 who completed the course are similar (40%).

Chart 6 Certification

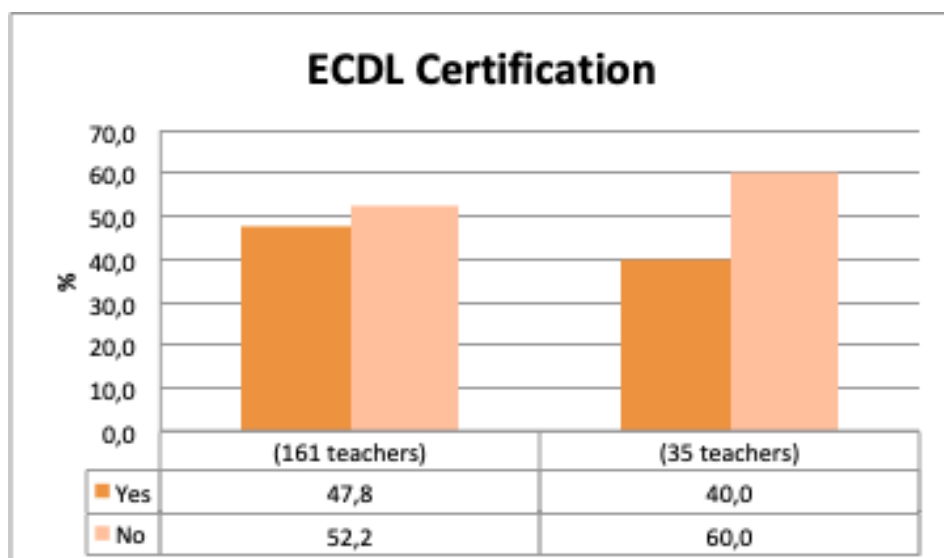
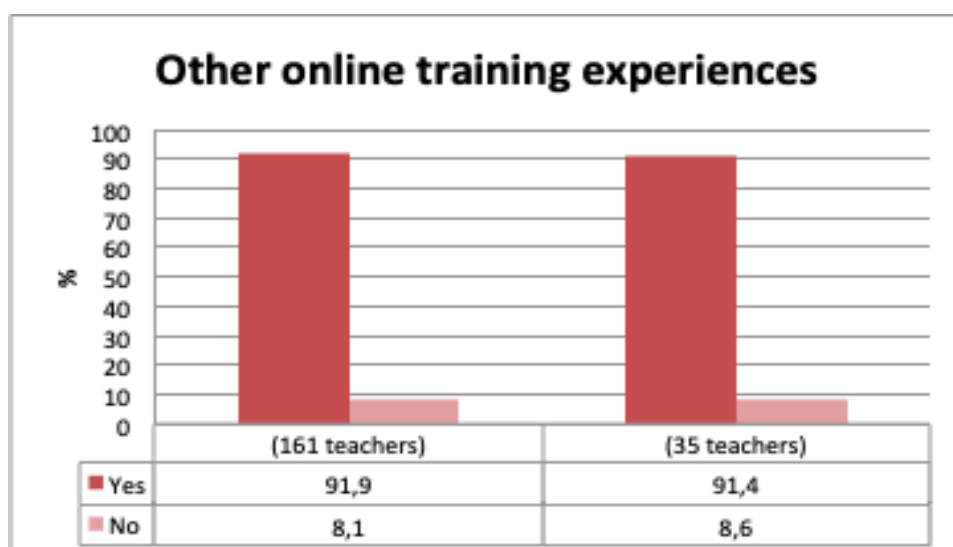


Chart 7 Online learning experiences



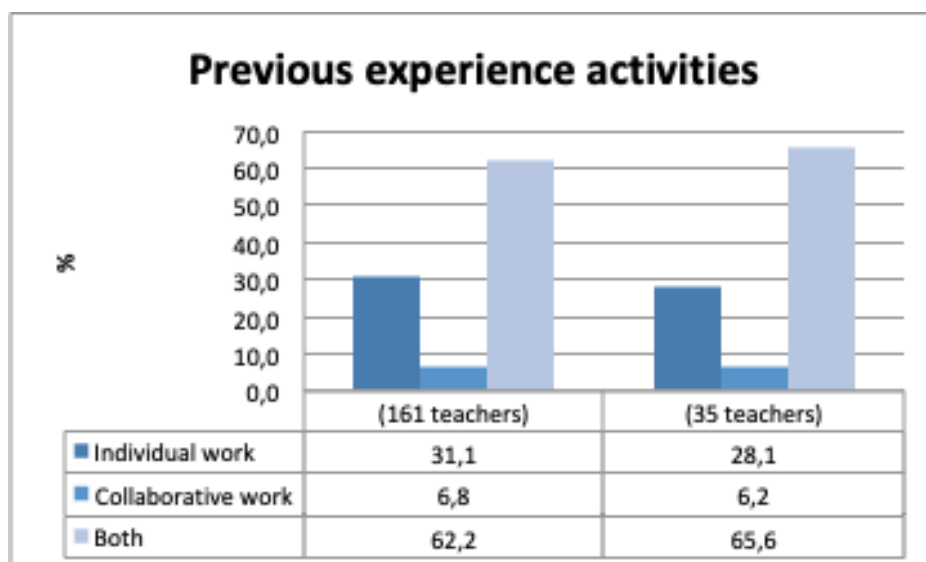
Unlike certified competencies, online learning experiences attended by 161 and 35 teachers were more numerous: 91,4% said they were involved in this type of learning prior the DECODE course.

Related to the group of 35 teachers who completed the course, higher percentage of them (91,4%) declared that they have participated in other online learning experiences and only 40% of them declared that they have certified their ICT competences (Table 2). These data matching with the results of the general survey where the greatest number of the respondents declare to not have obtained the certification.

Regarding the type of online learning experiences, the two groups (161 and 35) answered saying that they used both collaborative and individual work.



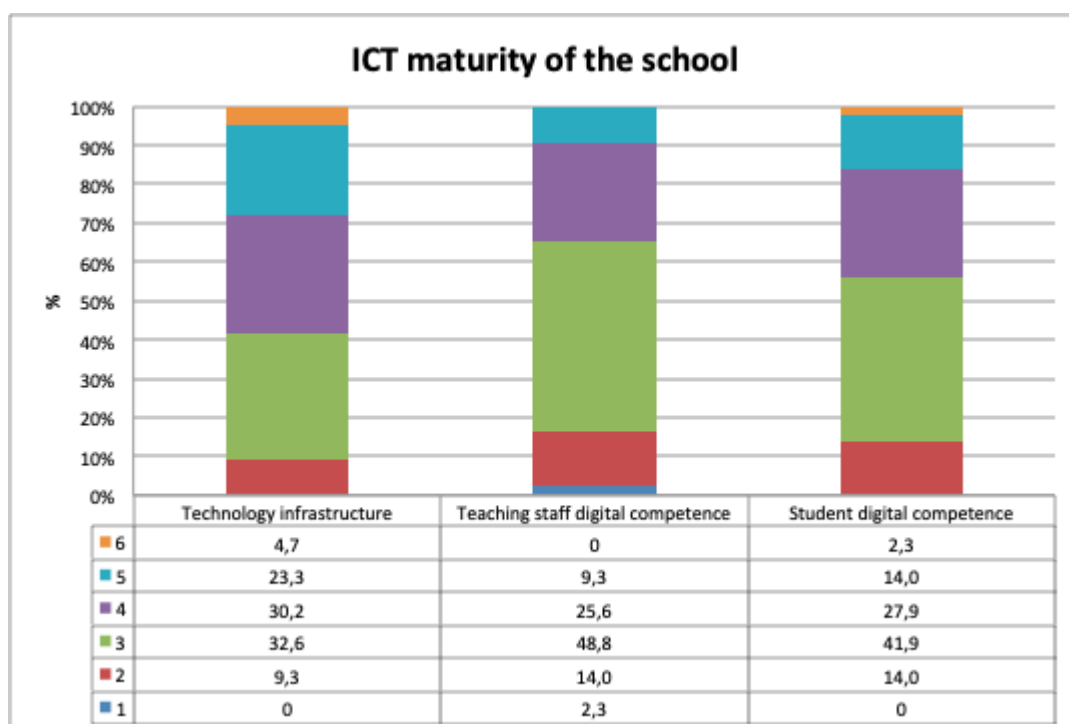
Chart 8 Previous Online work experiences



Regarding the type of online learning experiences, the two groups (161 and 35) answered saying that they used both collaborative and individual work (62,2% and 65,5%)

Evaluation of the ICT maturity of the school

Chart 9 ICT maturity of the school



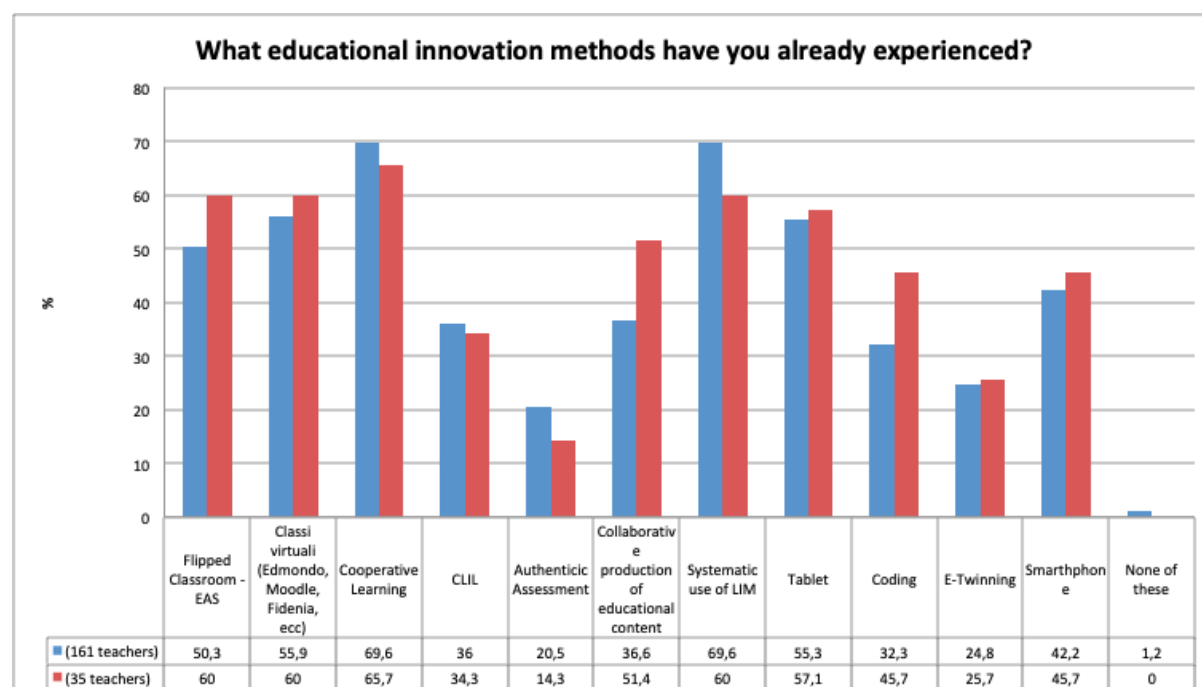


At the end of the DECODE course the 43 Italian participating teachers were asked to evaluate the ICT maturity of the school. Respondents (32,6%) appreciated on medium-low average the technological infrastructure, the digital competencies of the teachers (48,8%) and the digital competencies of the pupils a little (41,9%). Only a very small percentage (2,3%) consider the teaching school staff either very little mature or very mature for technology infrastructure (4,7%) and student digital competence (2,3%).

We underline that a positive evaluation - 58.2% which adds the rating from 4 to 6 points of the proposed Likert scale - related to the "technological infrastructure" supplied to the school, does not correspond to an equally positive evaluation with respect to the digital skills perceived in the students (44,2%) and teachers (34,9%). Furthermore, the competence of students (44,2%) is perceived as greater than that of teachers (34,9%).

Some additional questions we posed to teachers focused on their experiences about educational methods, courses to improve their digital skills, training needs and use of digital methodologies in the classroom.

Chart 10 Educational innovation methods

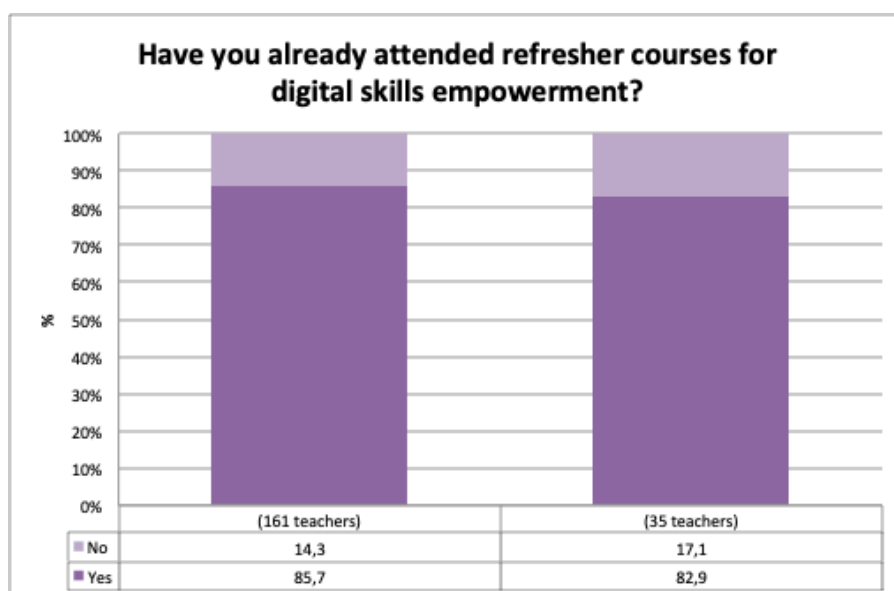


The first 161 and 35 asserted that the most commonly used method is, respectively, referring to: Flipped Classroom (50,3%-60%), Virtual Classroom (55,9%-60%), Cooperative Learning (69,6%-65,7%), LIM (69,6%-60%), and Tablet use (55,4%-57,1%).



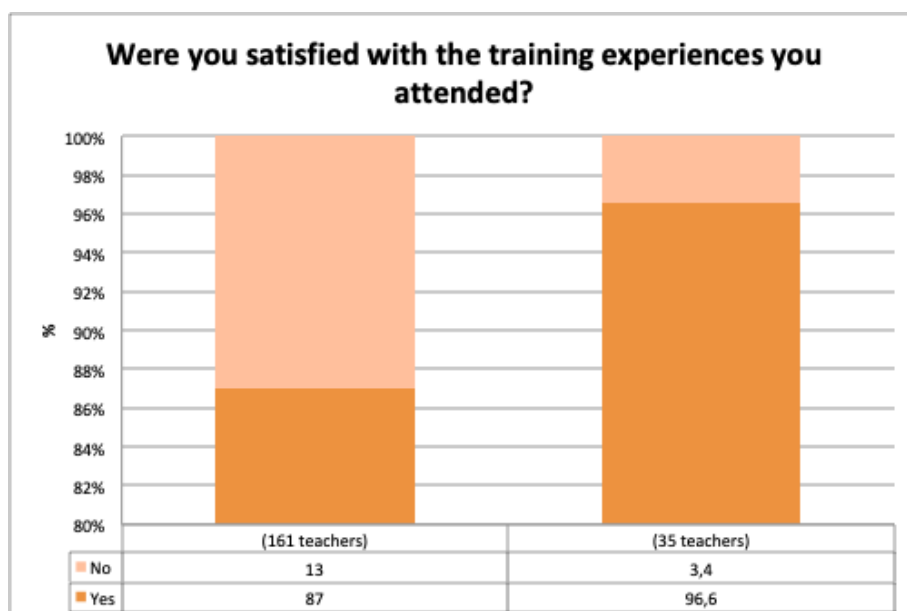
51.4% of the 35 teachers who completed the course had already had experience in collaborative learning and digital content production, compared to 36.6% of the 161 interested in training. Perhaps the well-known methodology allowed the 35 teachers to complete the course. The figure reflects the importance of profiling incoming digital skills/experiences to adapt the training offer to the real needs of the participants.

Chart 11 Course attended for digital skills empowerment



As represented by the data, a very high percentages of teachers (161: 85,7%; 35: 82,9%) attending the learning course to improve their digital skills.

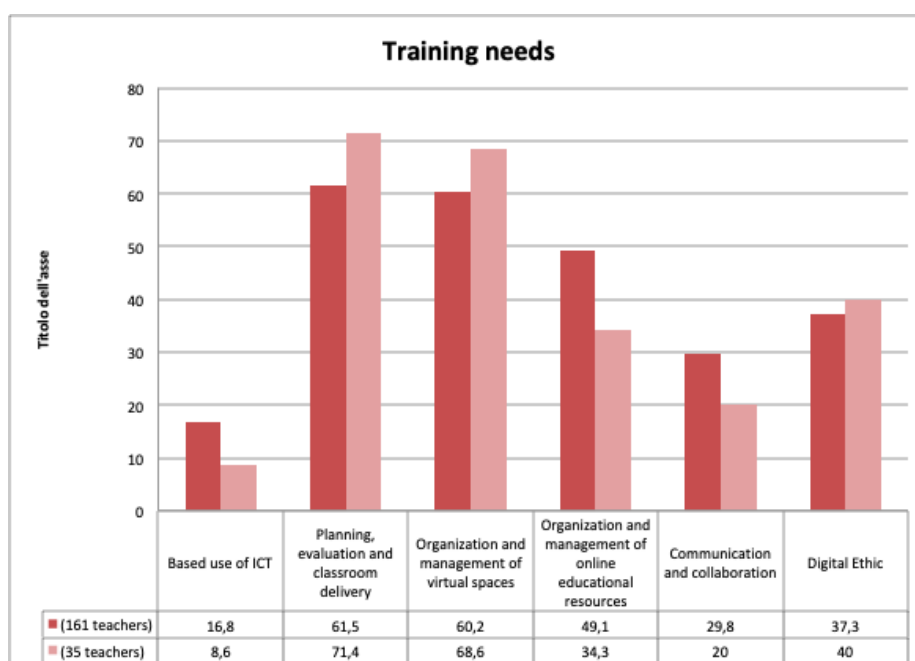
Chart 12 Satisfaction on training experiences





Also the satisfaction regarding the contents of the courses attended is particularly high: for 161 is 87% and for 35 is even higher: 96,6%.

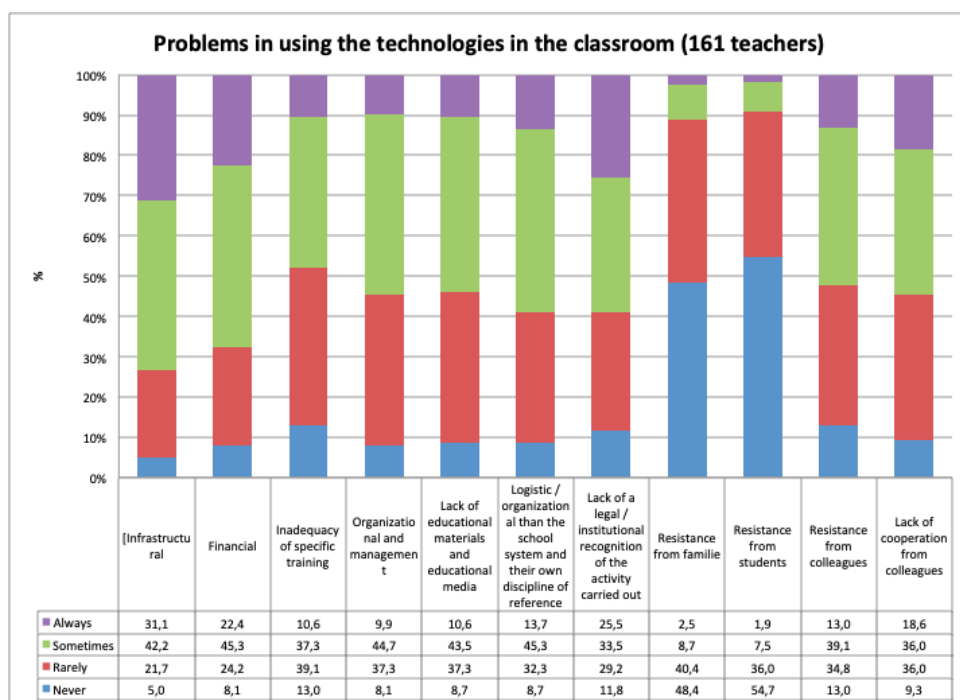
Chart 13 Training needs



The needs of teachers' digital skills are focused on "organization and management of virtual spaces" (161: 60,2%-35 68,6%), on planning evaluation and classroom delivery (161: 61,5%- 35: 71,4%). There are very low percentages represented by needs on basic use of ICT and on Digital Ethics (161: 37,3%-35: 40%).

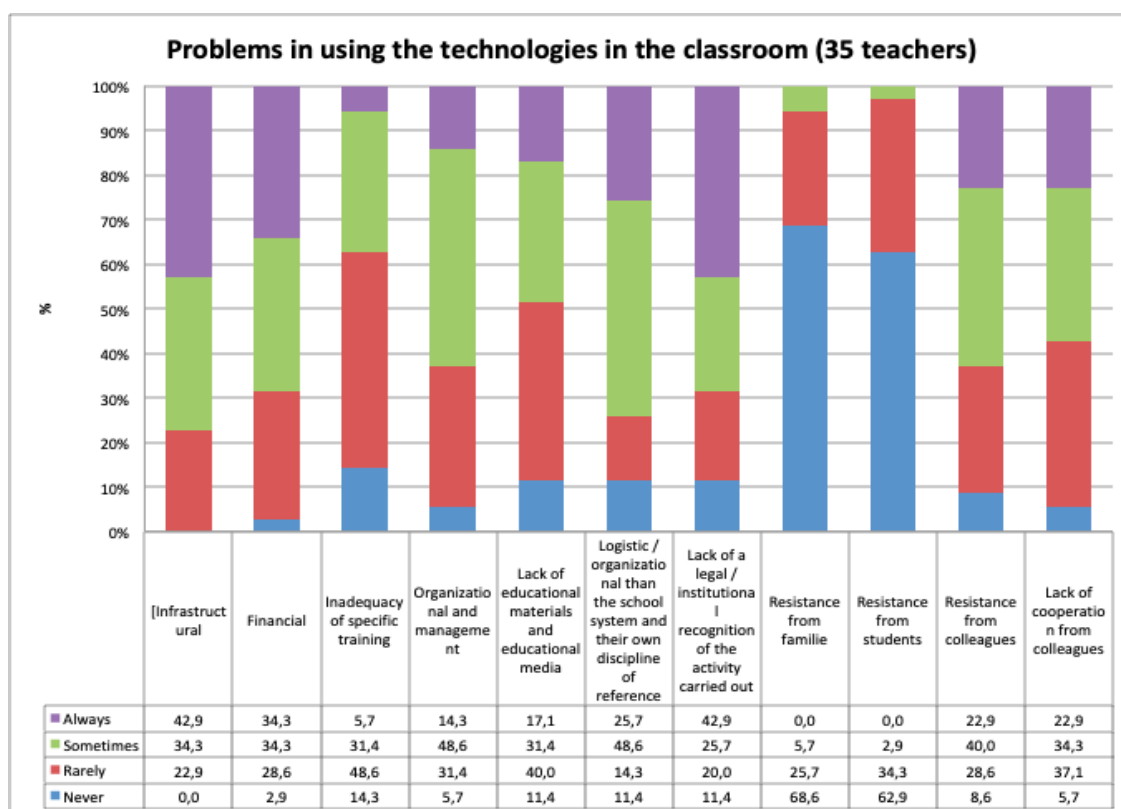
The 35 teachers who continued the training path declare that for 8.6% they need basic training on the use of ICT compared to 16.8% of the 161 who entered training. This can be another factor behind the high drop out rate of the course.

Chart 14 Problems in using technologies (161 teachers)



The majority of 161 teachers declared to meet sometimes technologies problems.

Chart 15 Problems in using technologies (35 teachers)





The majority of the 35 teachers who completed the course affirmed to encounter technological problems. The most interesting data come from Infrastructural issues, for which the 42,9% declared to encountering problems always. Logistical problems are underlined by 48,6%, the same percentage for who confirmed to have organizational and management issues. Instead the inadequacy of specific training (48,6%) and lack of educational materials and media is rarely perceived (40%). A problem detected by 63% (always + sometimes) is the resistance of colleagues and the lack of cooperation between teachers (57.2%).

3.4.4. Level of Digital Competence Perception

In this section we focused on the level of digital competences of teachers. The initial and final evaluation of the digital competence measures the deviation perceived by the participants between the beginning and the end of the course. **The analysis involved the 35 teachers who completed the course and filled out both the final and initial questionnaire.** The question was: *What do you think is your level of methodological digital competence*?* We asked teachers their perception level of competences including:

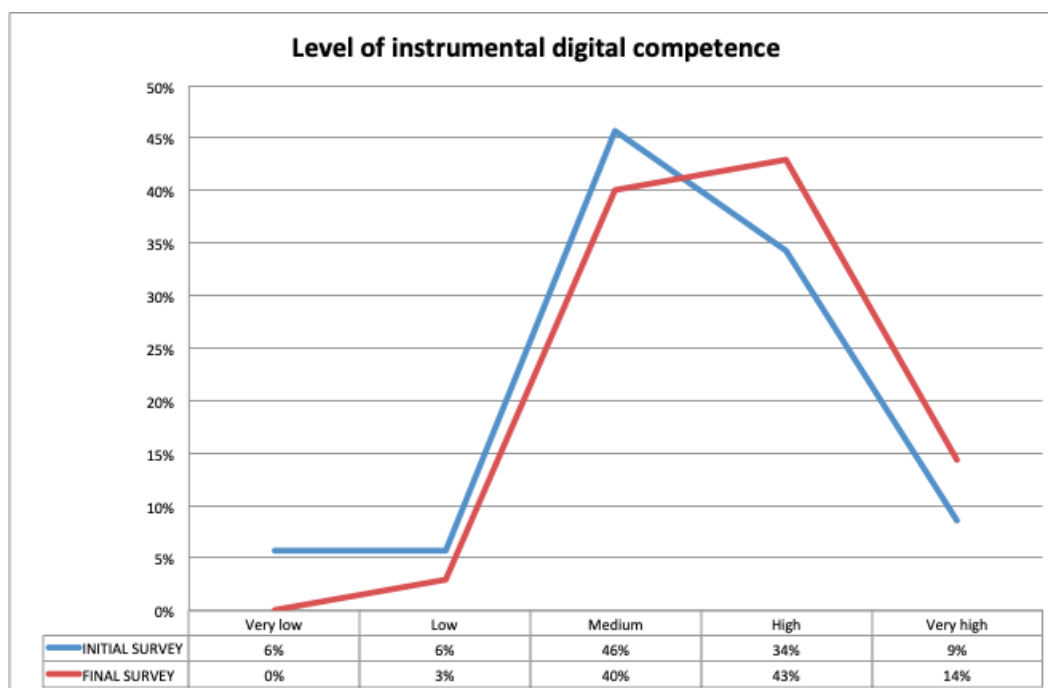
- 1) Using digital technologies in designing activities or learning situations
- 2) Using innovative methodologies through digital technologies
- 3) Defining the monitoring and assessment strategy of pupils in the teaching-learning process (self assessment, peer assessment)
- 4) Searching and critical selection of proper resources for the context and the specific learning objectives
- 5) Incorporating students' digital competences into educational activity
- 6) Appropriate application of media and digital environment rules (content, language, correct management)
- 7) Optimizing digital information management
- 8) Digital technology used in communication with peers
- 9) Active participation in educational networks through digital environments
- 10) Fostering the joint construction of knowledge based on digital technologies
- 11) Respecting licenses for the use of digital resources
- 12) Awareness and management of own digital identity in online interactions



13) Reflective practice on the professional use of digital technologies

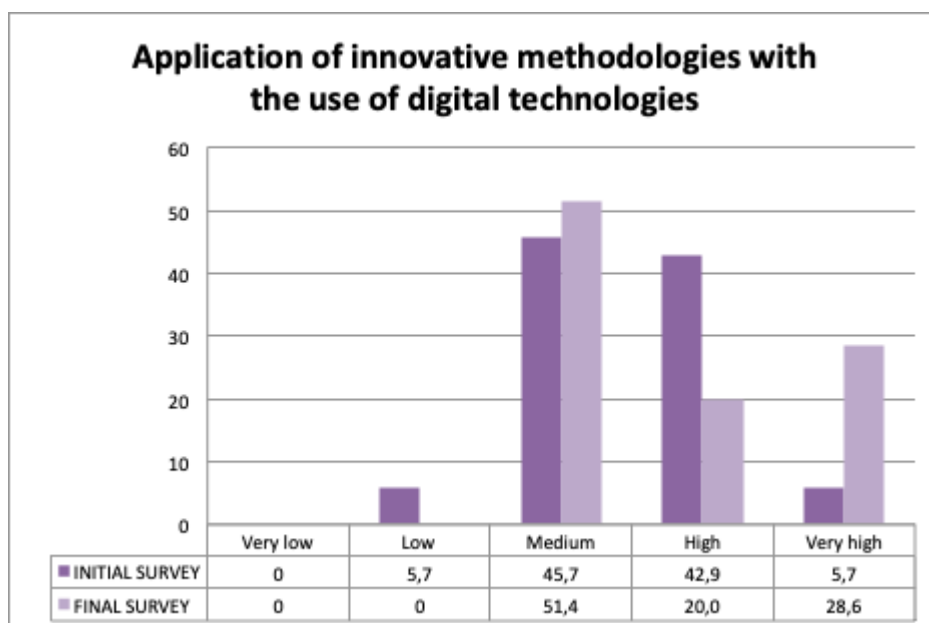
14) Activate a professional digital profile in different networks and in your own educational context

Chart 16 Level of instrumental digital competence



The data shows two different results: those who declared in the initial survey to possess a medium competence (46%) on Digital Competences, affirmed at the end of the course to obtain a little decrease of 0,6% on it (40%). Conversely, those who confirmed in the initial questionnaire to have high skills (34%) declared to perceive an improvement (from 34% to 43%).

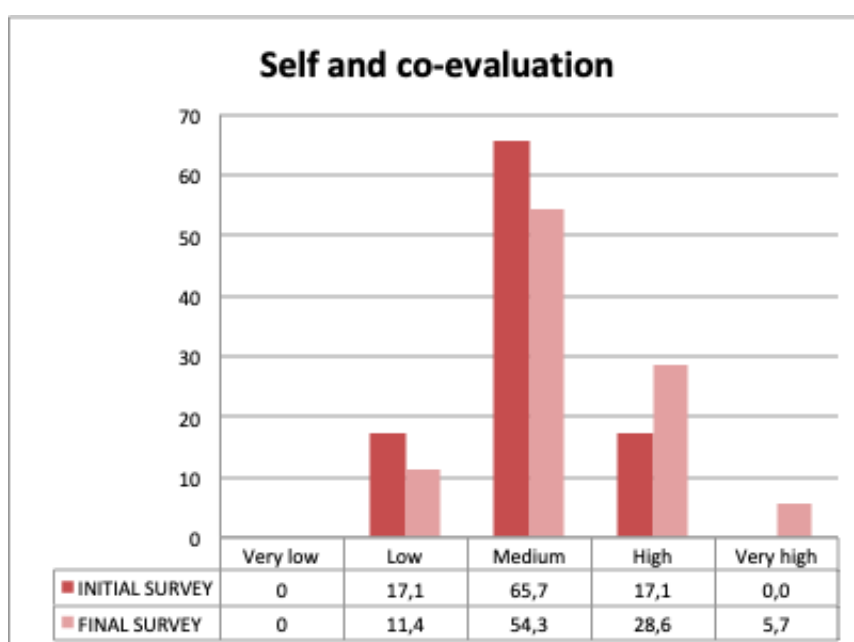
Chart 17 Application of innovative methodologies with the use of digital technologies



Regarding the use of digital technologies, the respondents who declare to have a high competences percentage (31,4%) at the end of the course declare an improvement (42,9%, +8,5%).

The most interesting results refer to the **application of innovating methodologies as in the initial survey the teachers declared high competences on this (42,9%), in the final survey the contrary is observed: the percentage of this competence drops to 20%.** It is probable that during the course path, they realized they did not possess these high skills.

Chart 18 Self and co-evaluation



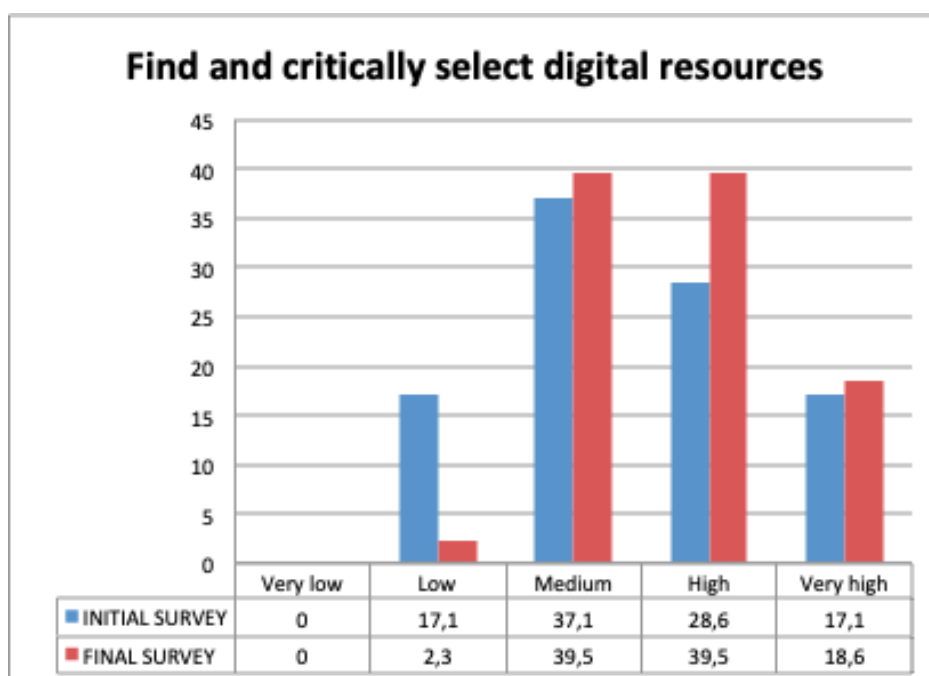
This means that the course from the didacting point of view, has led to an objective reflection of one's competences. The opposite happens for who declared to have very high competences: in the initial



survey the percentage of them who think to have low competence, at the end of the course declare to improve it (28,6%) with a + 27,9%.

Regarding self and co-evaluation, the percentages show impressive results: from a low percentage on high (17,1%) the improvement is +11,5% (28,6%). Instead for very high competences the respondents from 0% improve to 5.7%. This evidence is most probably linked to the weight of the peer review activity and, in addition, the final evaluation of the SDAs, during the training.

Chart 19 Find and critically select digital resources



Regarding finding and critically selecting digital resources the teachers who declare to have high (28,6%) and very high (17,1) involved in the course path improve these competences for respectively to 39,5% and 18.6%.

For those competences, which directly involve the students, we can see how those who declared to have high competences (48,6%) in the initial survey, realized that they did not possess it in the final survey (37,1%). An Interesting observation is the results for those who affirmed in the initial questionnaire to not have very high competence (0%): in the final declare an improvement of 20%.



Chart 20 Incorporation of Digital Competences of the students in the educational activity

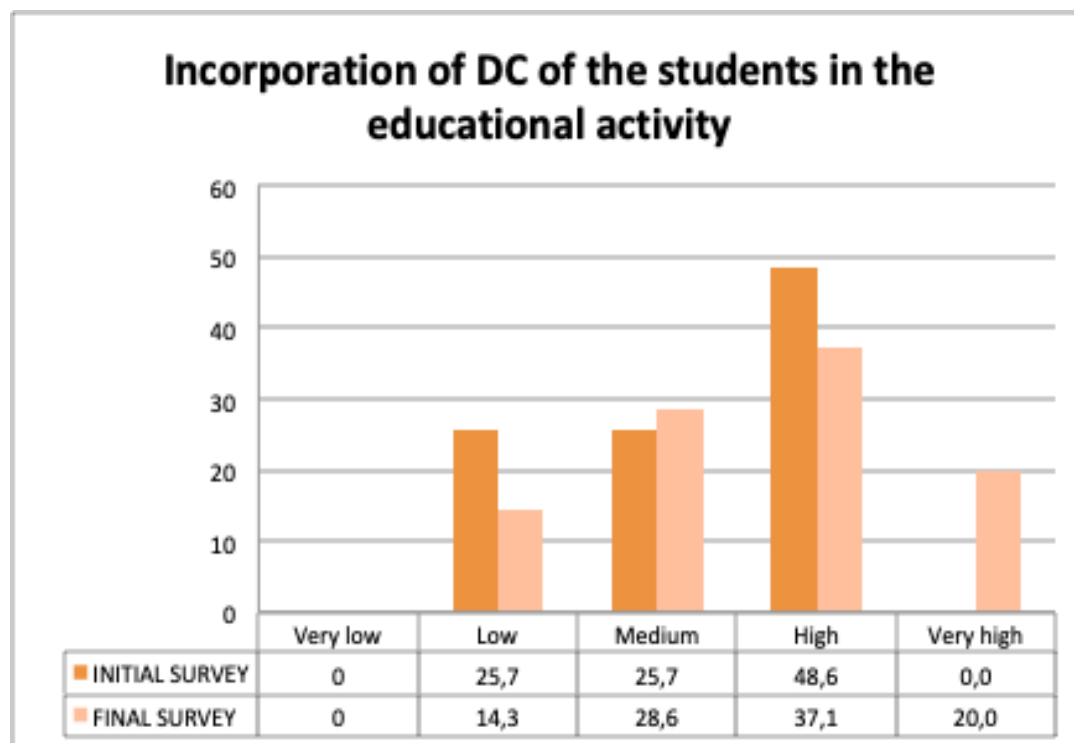
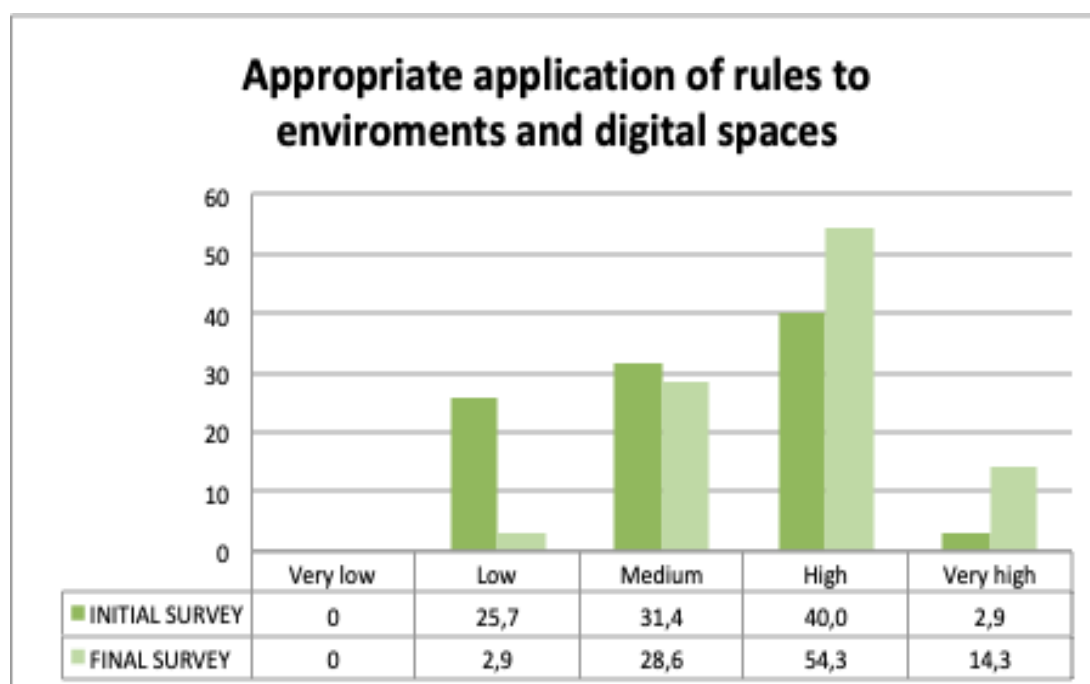


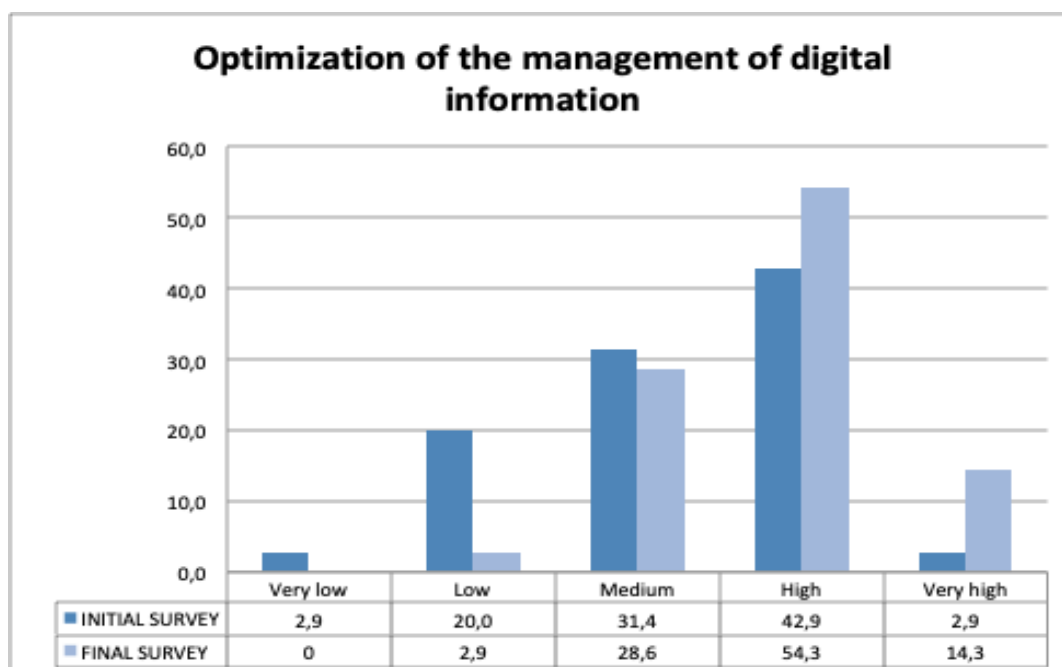
Chart 21 Appropriate application of rules to environments and digital spaces





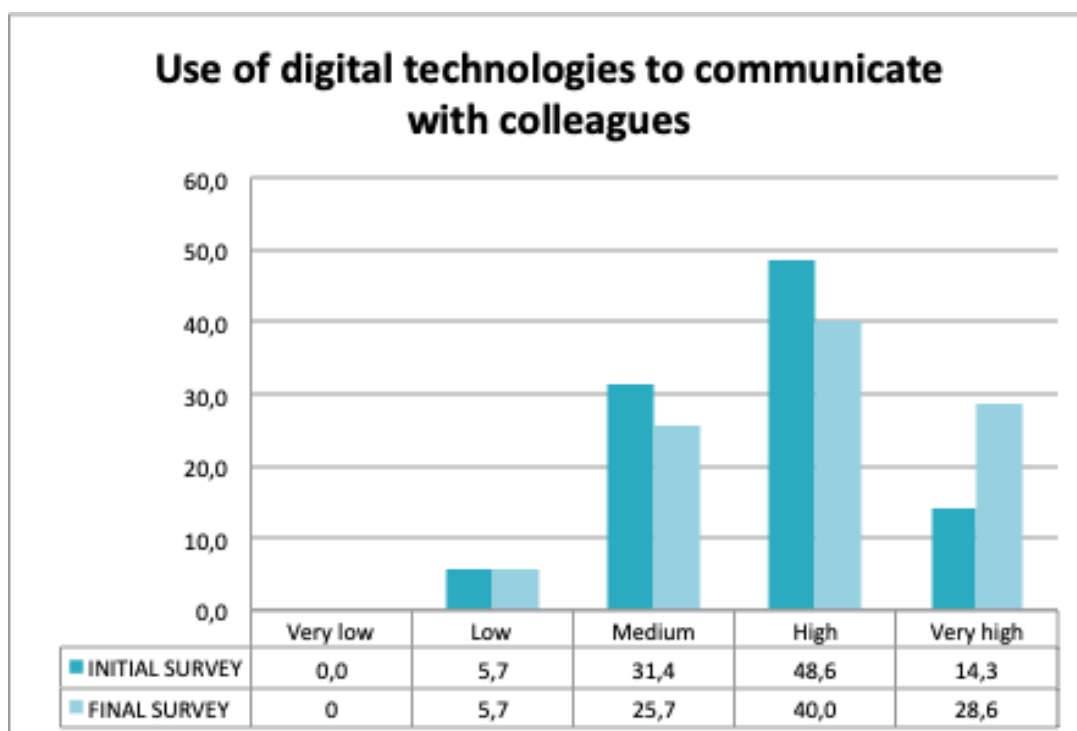
The application of rules to environments and digital spaces presents a little increase for who declared to have high percentage (from 40% to 54,3%) and for who declared to have very high competences in this improve to 14.3% from 2,9%.

Chart 22 Optimization of the management of digital information



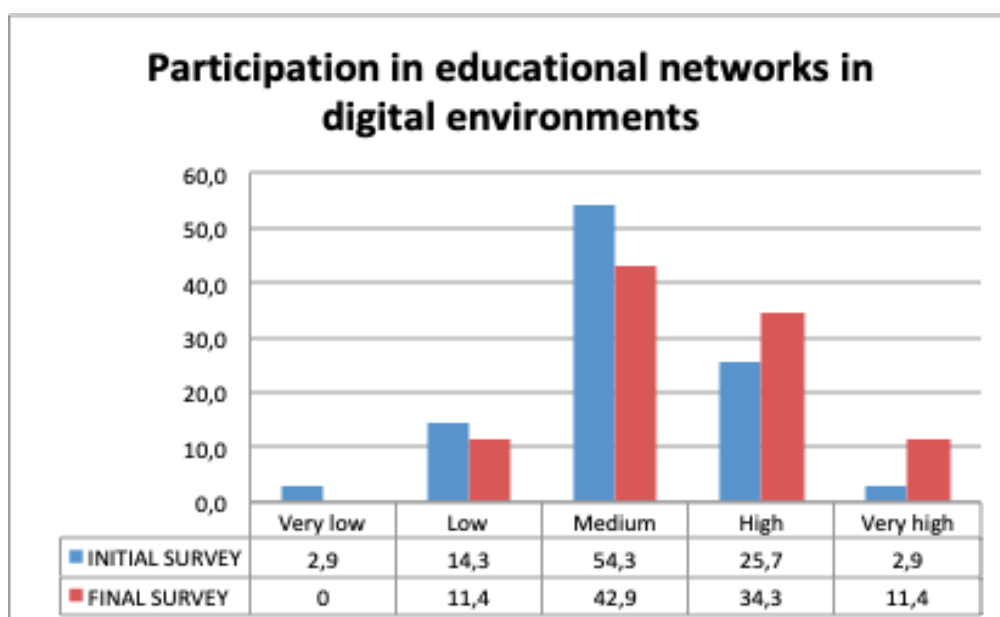
The percentage of respondents who affirmed to have very high competence on optimization of the management of digital information shows an increase of + 11,4%.

Chart 23 Use of digital technologies to communicate with colleagues



The use of digital technologies to communicate with colleagues shows an increase of 14% for those who asserted in the initial survey to possess very high competences. In the data, a little decrease appears between those who responded to have high competences in the initial survey and final survey (from 48.6% to 40%).

Chart 24 Participation in educational networks in digital environments

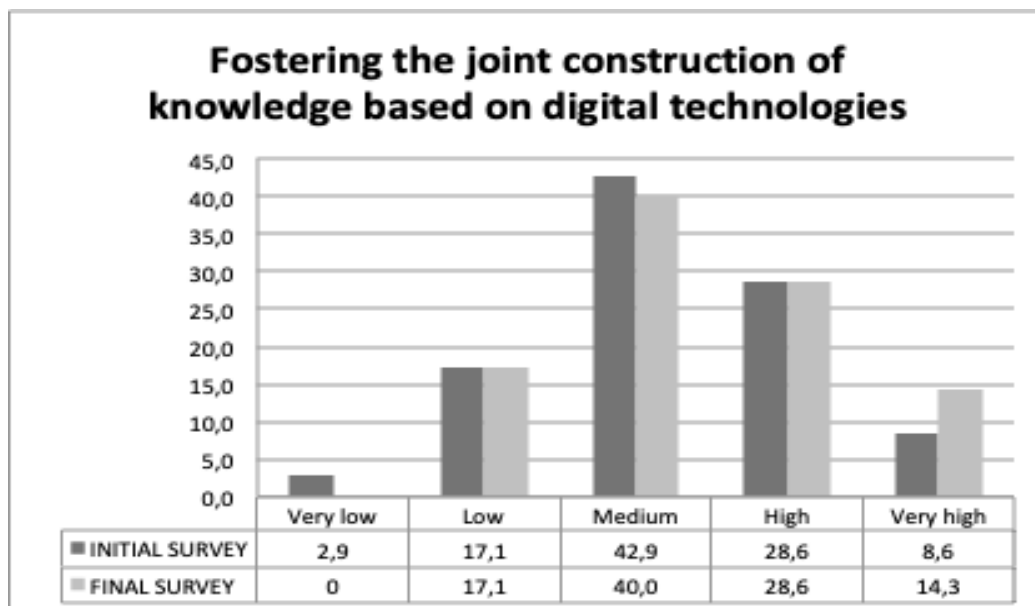


Regarding participation in education networks in digital environments, we can see the perception of competences increases for teachers who declared to have high (from 25.7% to 34.3%) and very high competences (from 2.9% to 11.4%). These data suggest the fact that the course path has been a



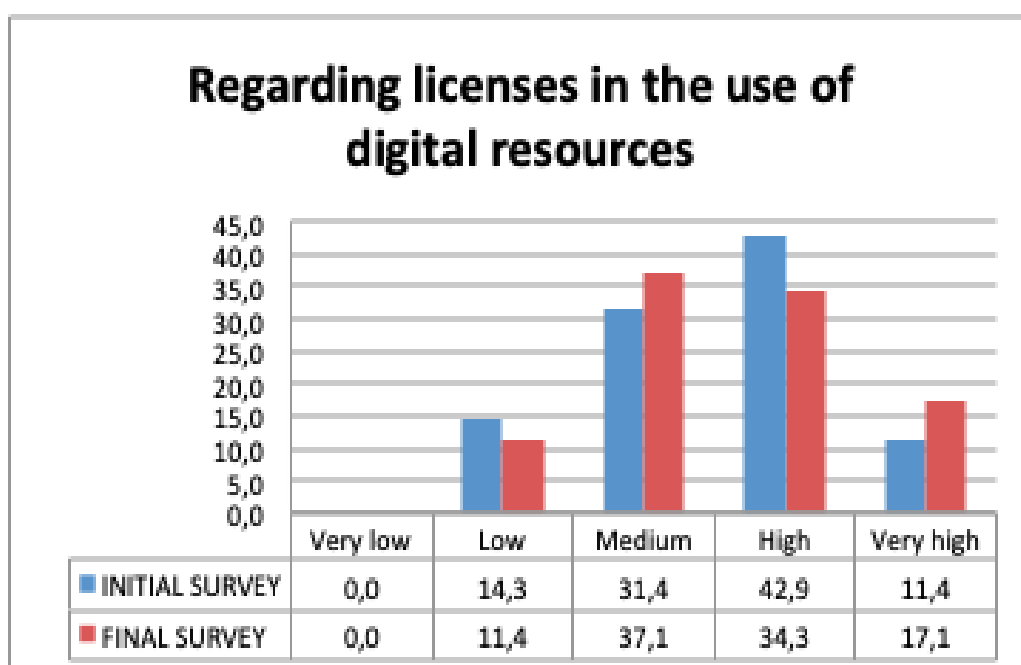
good practice through which participants had the opportunity to share and collaborate during the activities with colleagues.

Chart 25 Fostering the joint construction of knowledge based on digital technologies



The data about the joint construction of knowledge based on digital technologies shows an increase only for those who declared to have very high competences about it (from 8,6% to 14,3%).

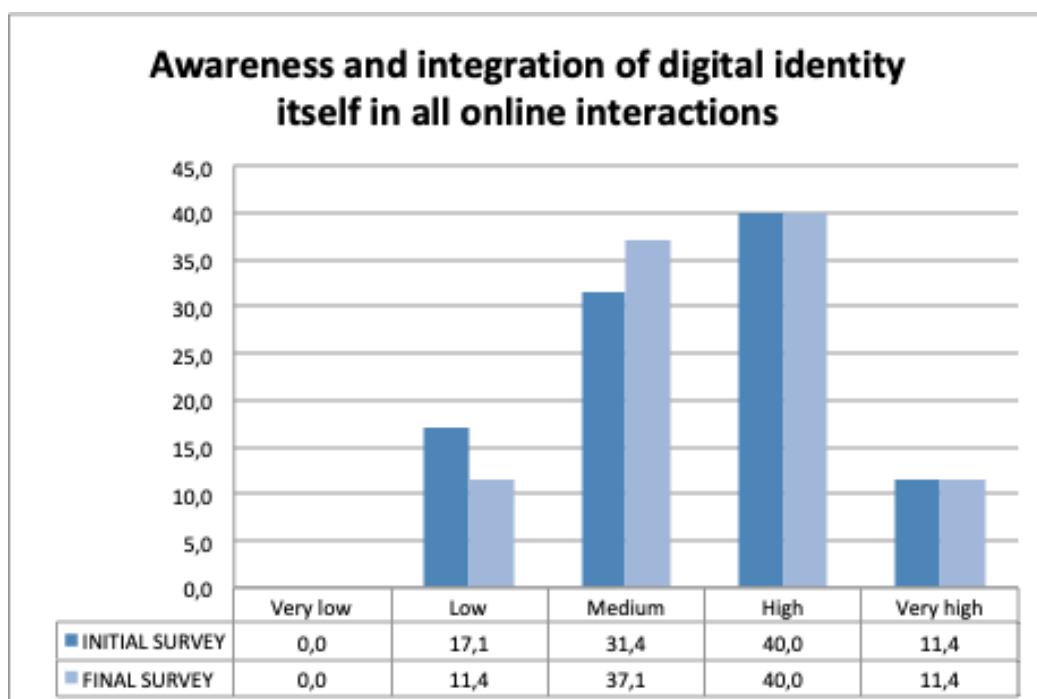
Chart 26 Regarding licenses in the use of digital resources





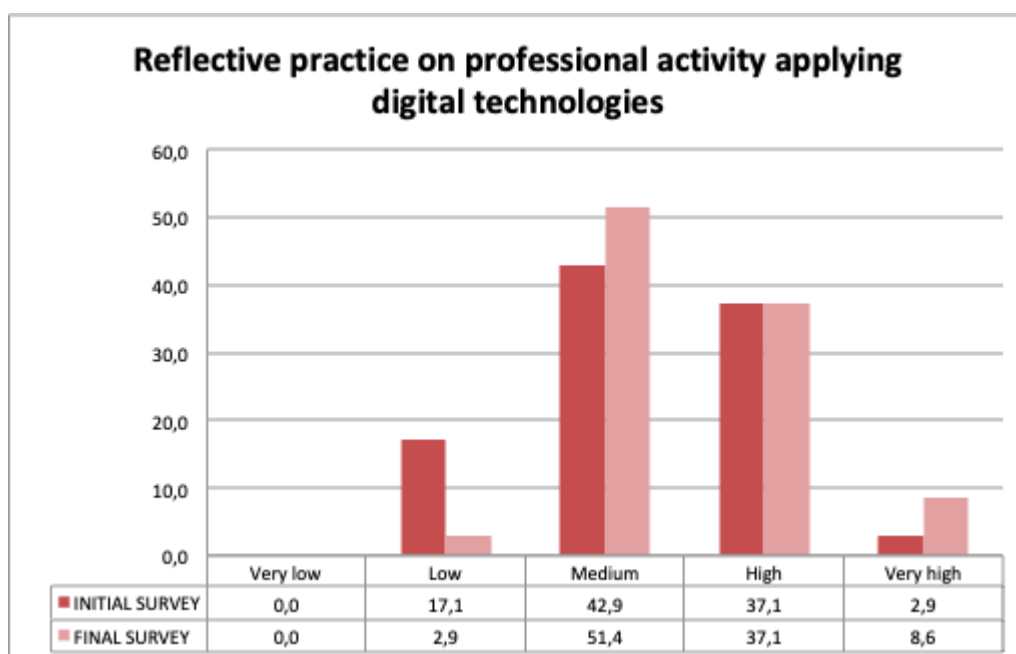
The perception of teachers who affirmed to have high competences related to the use of digital resources decreased from 42,9% to 34,3%. For those who declared to have very high skills the percentage increased from 11,4% to 17,1%.

Chart 27 Awareness and integration of digital identity itself in all online interactions



The awareness and integration skills of teachers in relation to the digital identity presents the same percentages for both initial and final survey (high: 40%; very high: 11,4%)

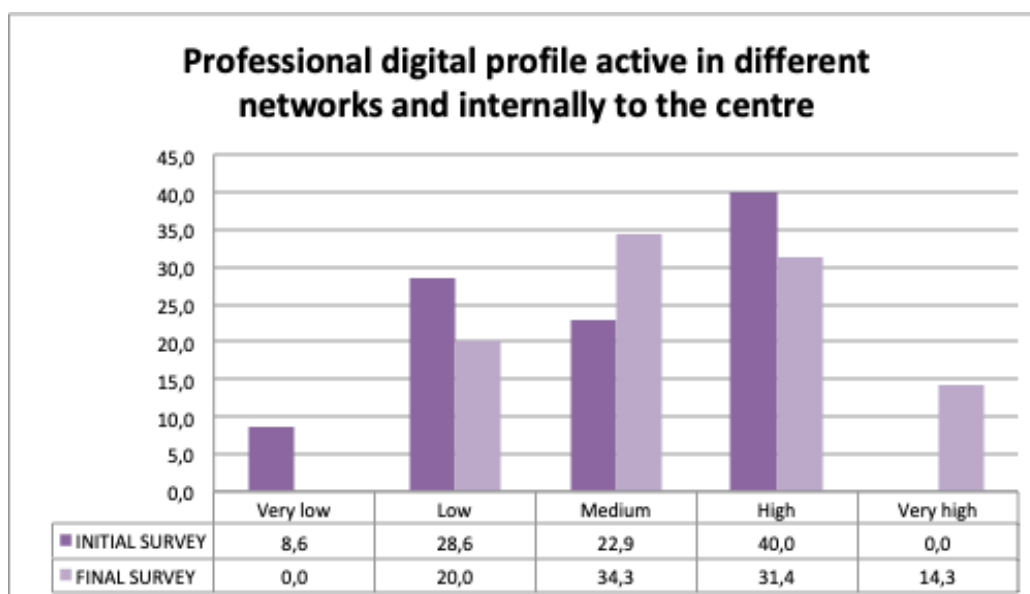
Chart 28 Reflective practice on professional activity applying digital technologies





Regarding the variables investigated in the initial and final survey a little increase in the reflective practice on professional activity applying digital technologies only for who asserted to have on this field very high skills was seen

Chart 29 Professional digital profile active in different networks and internally to the centre



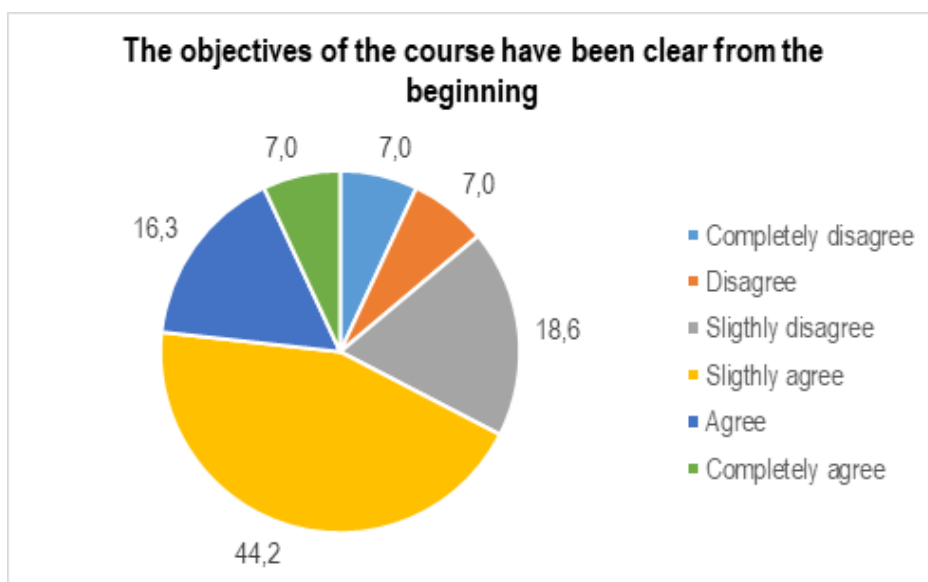
The activation of professional profile in different networks and internally to the centre presents a decrease of 11,4% for who affirmed to have, before the course, high competence in this field (40%). The percentage increase at the end of the course, from 0 to 14,3%.

3.4.5. Evaluation of the seminar

43 teachers completed the final questionnaire. These teachers have been enrolled in the entire course.

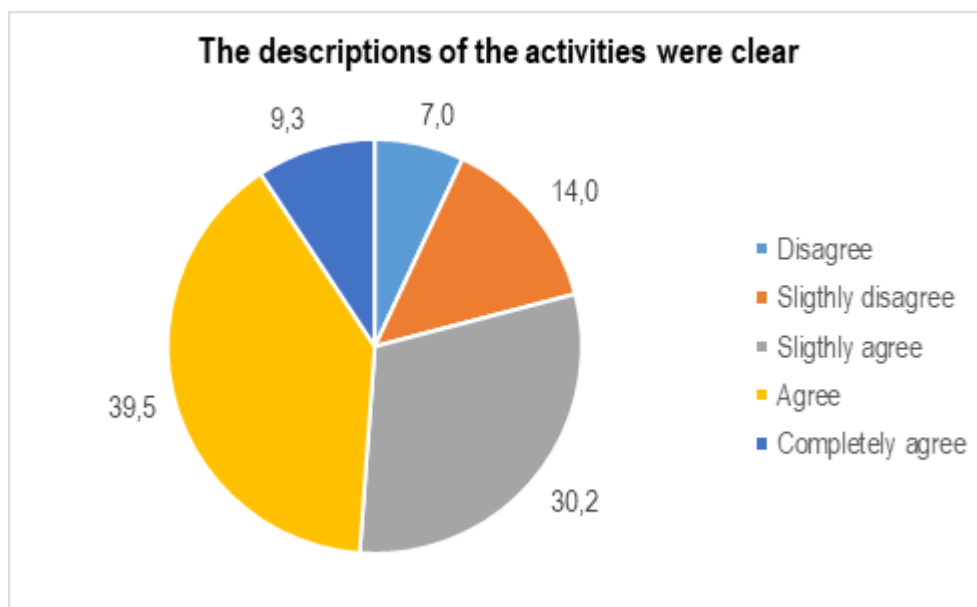
Course design

Chart 30 Clarity of objectives



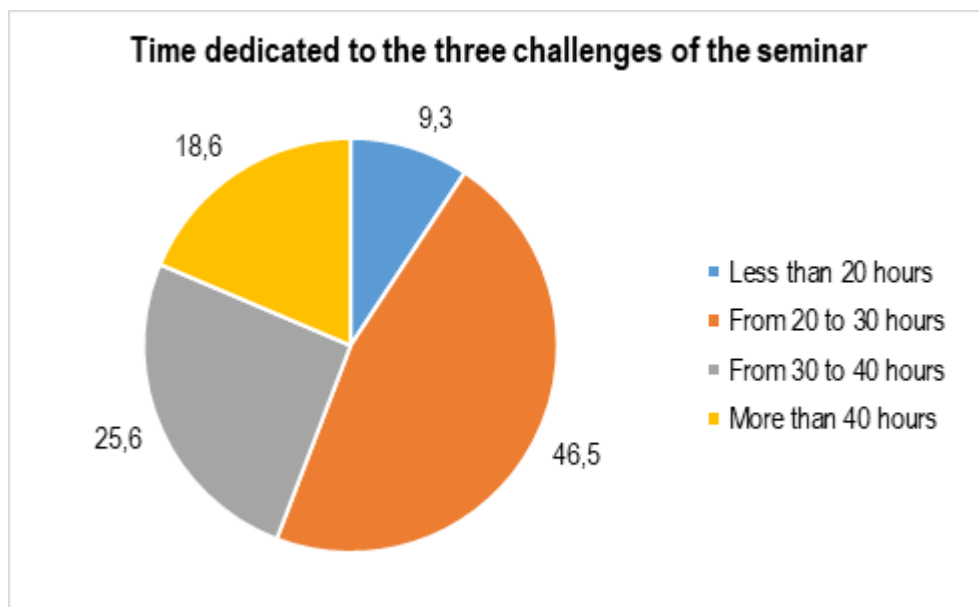
The objectives of the seminar were slightly clear from the beginning for the 44,2% of teachers. This relevant percentage indicates that something in the definition of the objectives was not completely clear in advance for teachers.

Chart 31 Clarity of activities description



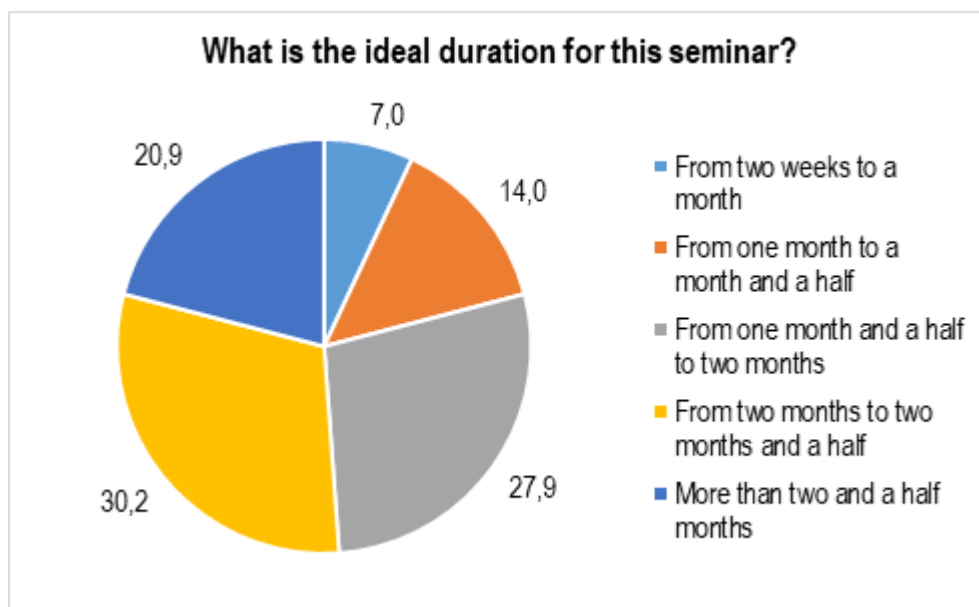
While the objectives were slightly clear in advance, the descriptions of the actives were clear for the 39,5% of teachers and slightly clear for the 30,2%.

Chart 32 Time dedicated to the training



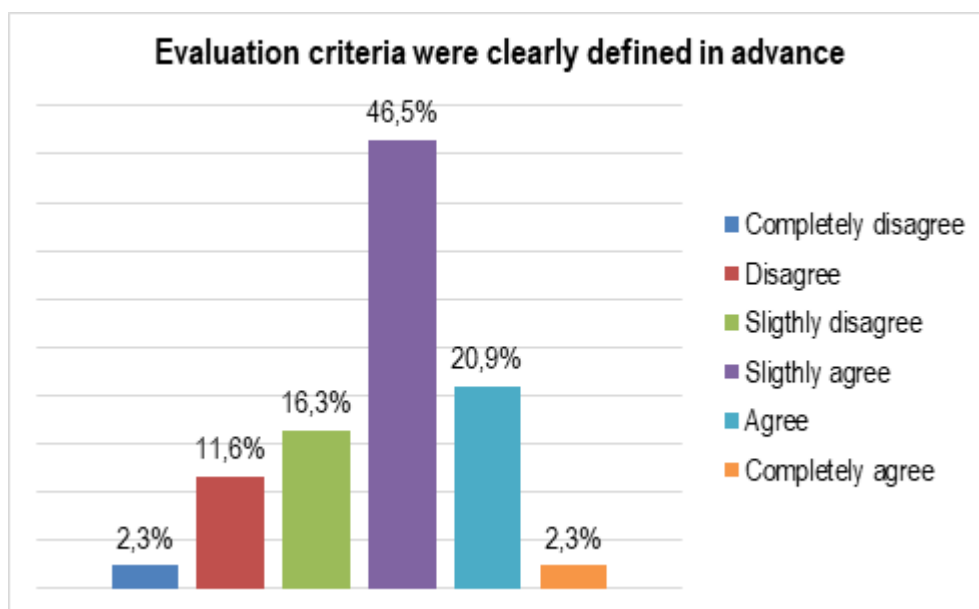
46,5% of teachers state they have dedicated from 20 to 30 hours to the course; with a further 25,6%, from 30 to 40 hours.

Chart 33 Ideal duration of the seminar



Considering the workload that the seminar involved, 30,2% state that the ideal duration for this seminar is from two months to two and a half; 27,9% state that the ideal duration is less: from one month and a half to two months.

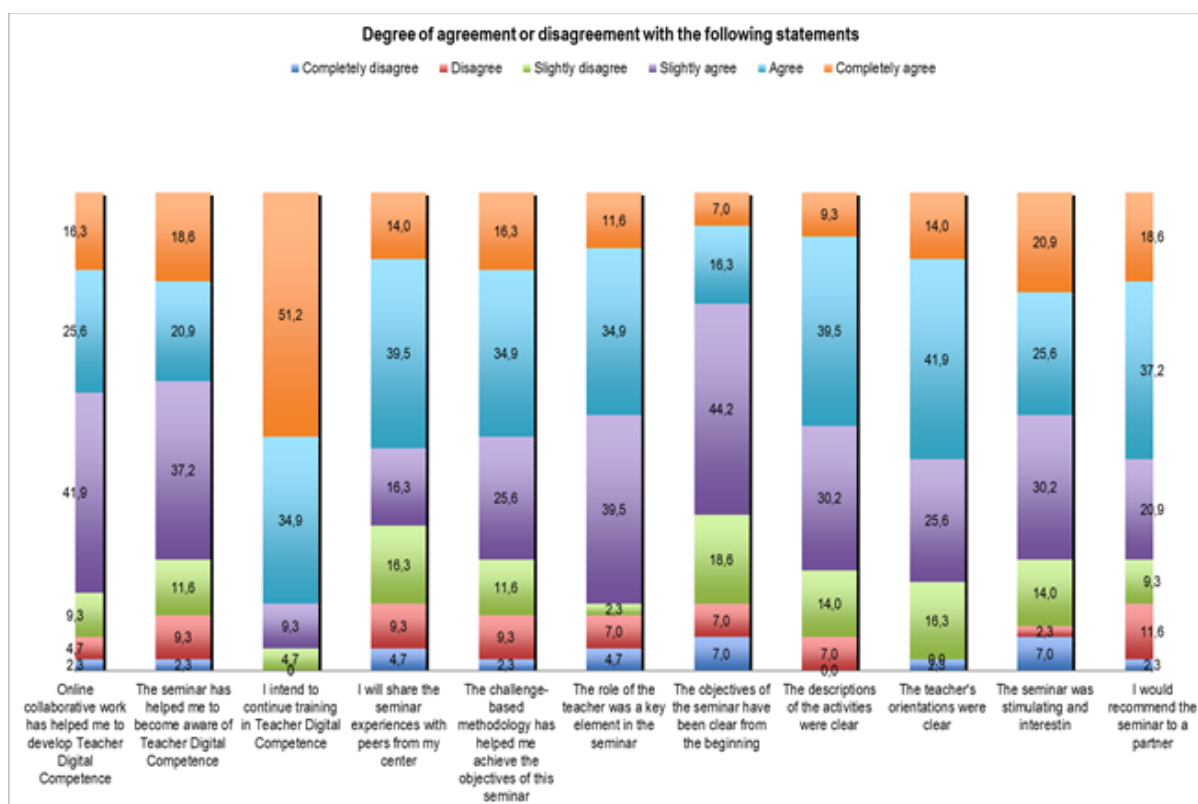
Chart 34 Clarity of evaluation criteria



46,5% of teachers state that the evaluation criteria were slightly defined in advance and 20,9% agree with this statement. The first percentage indicates that something in the definition of the evaluation criteria was not completely clear in advance.

Course methodology

Chart 35 Course methodology evaluation





The online collaborative work helped teachers to develop Teacher Digital Competence for the 25,6%; 41,9% slightly agree with the statement.

Data indicates that there are some elements of the training course, which can be improved.

The challenge-based methodology helped teachers achieve the objectives of the seminar for 34,9% of them; 25,6% state that they slightly agree.

There are doubts about the effectiveness of the adoption of the design-based methodology.

The seminar helped teachers to become aware of Teacher Digital Competence for 20,9% and for 18,6%, which completely agree; 37,2% slightly agree with the statement.

The course certainly had the effect of favoring the growth of interest on these issues and the development of a training needs self-analysis. 86,1% of teachers state that they intend to continue training to acquire additional digital skills.

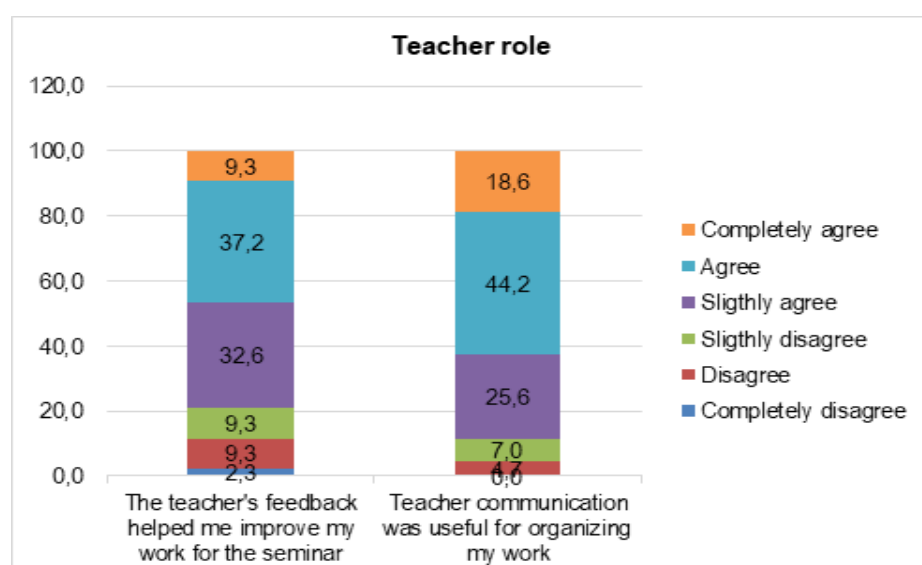
37.2% of the teachers, who declare that the course has not helped them to become more aware, identify the need to continue to train themselves on this topic.

Overall assessment

The seminar was stimulating and interesting for the 25,6% of teachers. 30,2% slightly agree.

Teacher role

Chart 36 Teacher role



Teacher's feedback helped participants improve their work for the seminar for 37,2% of respondents; 32,6% slightly agree.



Teacher communication was useful for organizing participants work for 44,2% of respondents. 18,6% completely agree. Communication competence was more appreciated than specific feedback for the work improvement. The role of the teacher was a key element in the seminar for 34,9% of respondents; but 39,5% slightly agree. The teacher's orientations were clear for 41,9% of respondents; 25,6% slightly agree.

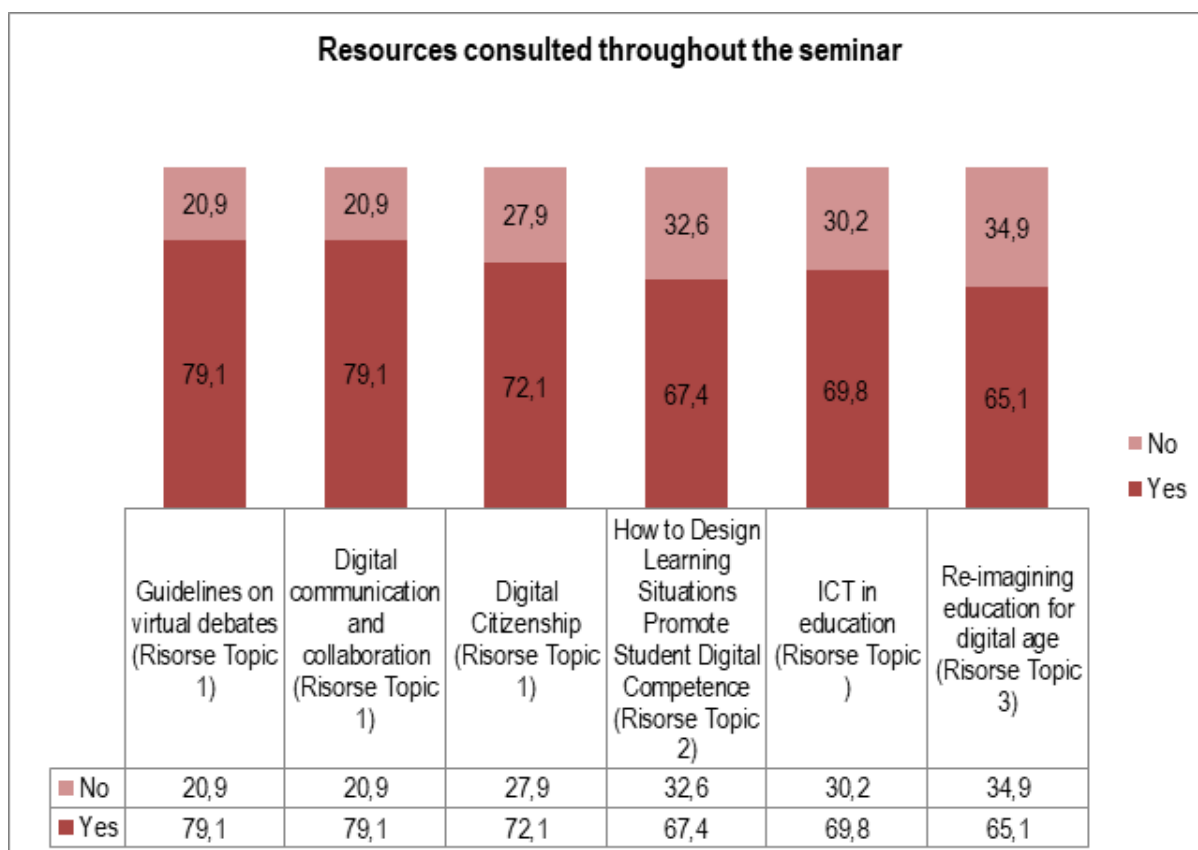
Transferability

39.5% of teachers state they will share the seminar experience with peers from their center.

There are elements of the experience that probably make it unsustainable. In line with this result, 37,2% of respondents would recommend the seminar to a colleague. 20,9% slightly agree.

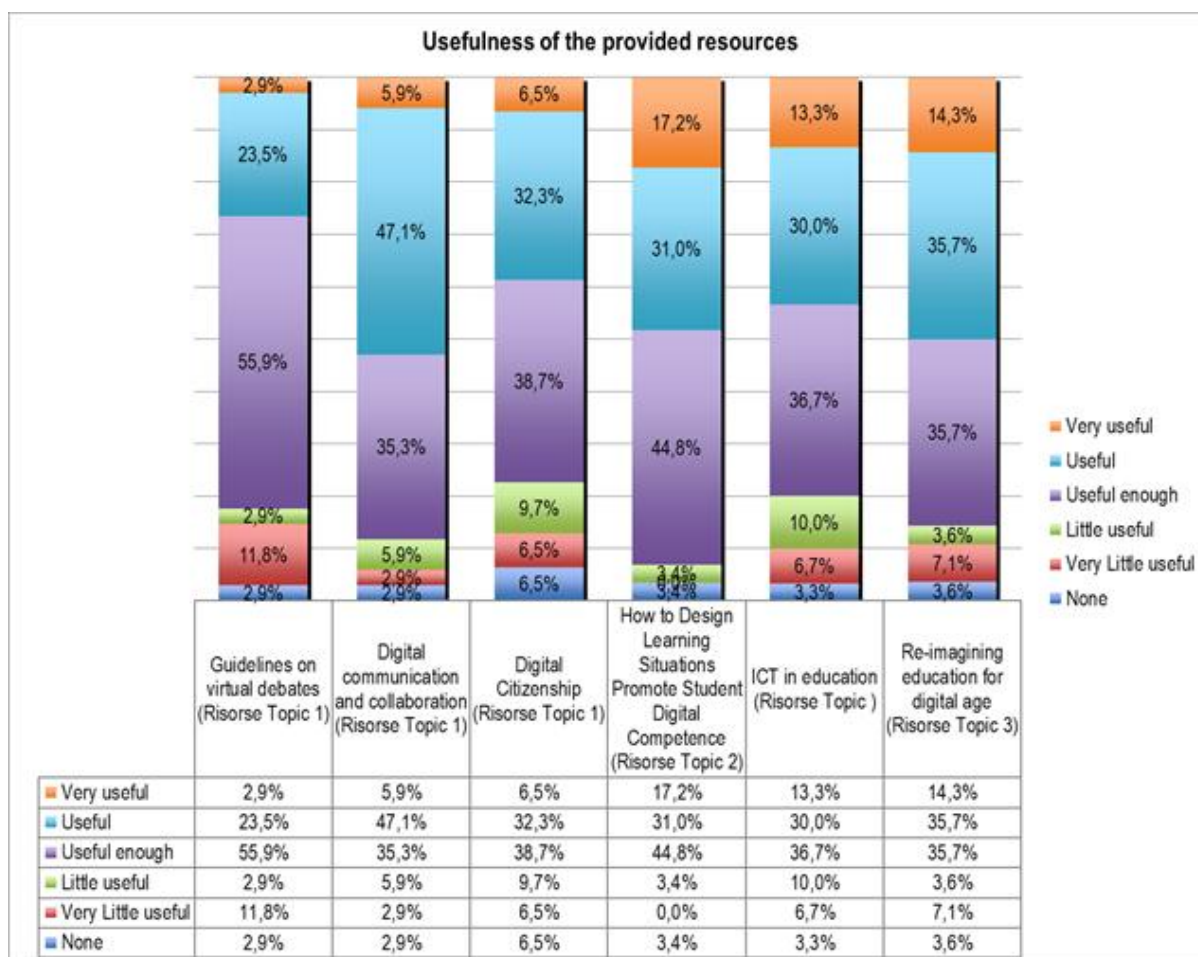
Resources

Chart 37 Resources consulted during the seminar



The most consulted resources throughout the seminar are:: guidelines on virtual debates, digital communication and collaboration and digital citizenship.

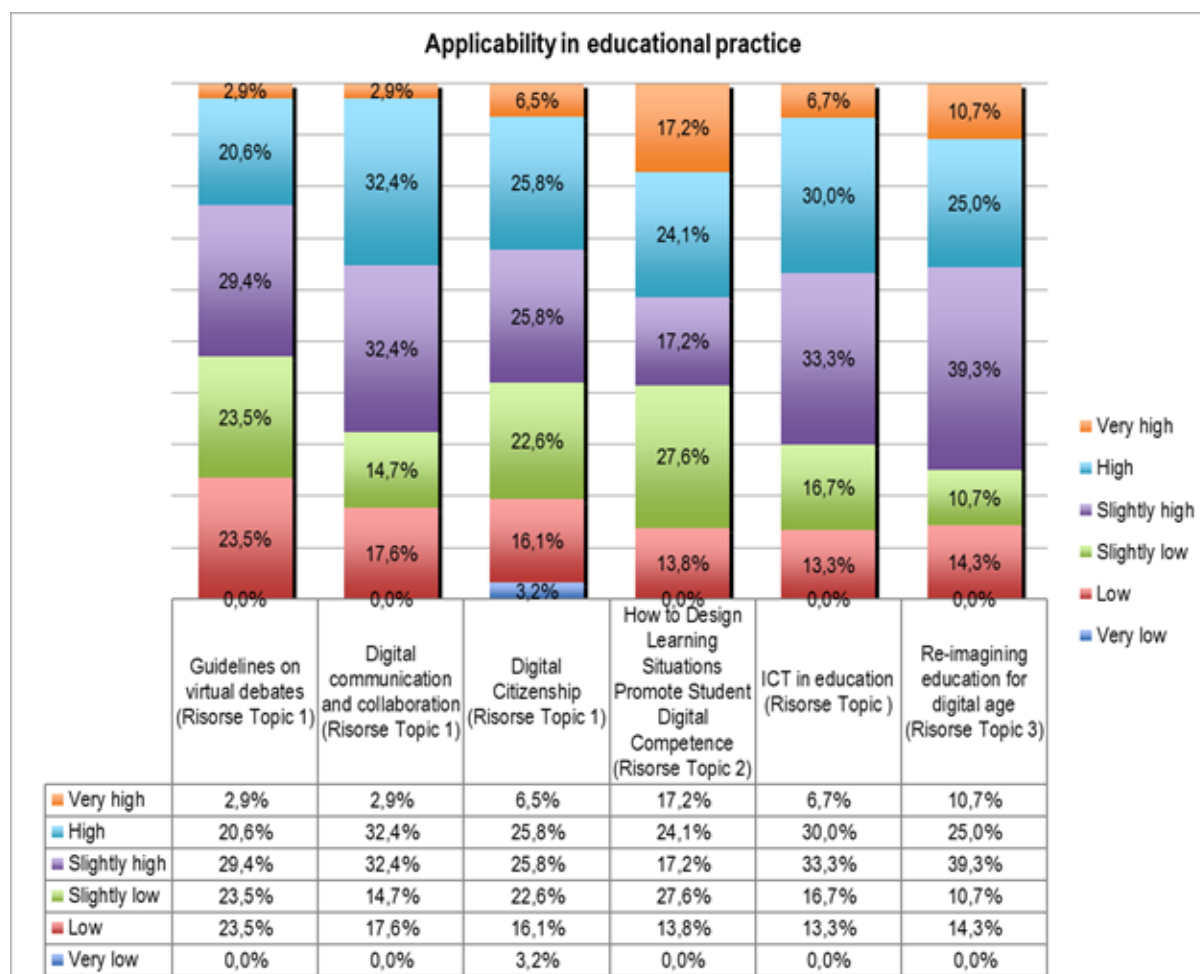
Chart 38 Usefulness of resources



If we consider the usefulness of the these resources, it is possible to observe that “how to design learning situations promote student digital competence” is considered very useful and as well as the resource “re-imagining education for the digital age”.



Chart 39 Applicability of resources in educational practice



Finally, if we consider the applicability of the resources in the educational practice, “how to design learning situations promote student digital competence” is the central competence recognized by teachers.

3.4.6. Suggested improvements

The observations made by the participants shows the appreciation of online collaborative work between colleagues. The revisions and exchanges between the teams, the increase of digital skills useful for teaching, the transferability of courses’ path, the learning situations are considered strengths and interesting opportunities for professional growth.

The use of technologies to sharing design has been a challenge for some to improve their team-working skills, while the online Moodle platform has generated more critical issues, but at the same time constructive observations. Some teachers found difficulties in finding materials and understanding deliveries. Other critical aspects were the impossibility of proceeding with simultaneous shared writing, which would have shortened the team’s working times, but also the graphic choice that, according to



some, would not have favored readability. The addition of a clear chrono-program at the beginning of the course and a check-list for each phase of the course are suggested by some to facilitate the work, also considering the increase in deliveries in a period already crowded with school commitments.

the coordination of the tutors who, also communicating with the participants through the reserved area and private messaging active on the platform, accompanied them during the course path and clarified some process aspects was greatly appreciated. In this regard, the most frequent improvement suggestions concern the diversification of communication methods, such as tutorials, webinars, interactive presentations, along with non-textual in depth resources in order to make the work environment more effective. Another observation object was the random composition of the groups. Longer and more relaxed times would have allowed a more in depth knowledge among the participants who could have been grouped by affinity. These critical issues detected by some was instead experienced by others as an opportunity to get involved with unknown people, raising the level of complexity and thus making the challenge more interesting. Equally the English language represented an obstacle for some who, however, have had the ability to overcome the difficulties of the case.

“The comparison and the constructive dialogue enabled us to take action to improve ourselves.” A positive synthesis that, even with the criticalities detected, makes us aware of the meaning attributed to the path we are faced and the importance that teamwork has in improving a professional community.

3.4.7. Conclusion: final reflection

The aims of the training pilot was to enhance digital competence of teachers and its use in teaching practices by a Project Based Learning methodology.

In light of the overall assessments we can conclude that the pattern achieved the expected results both for the number of participants involved: 161 subscribers; 43 active participants; 35 who completed the course; 5 good practices evaluated by the participants themselves as meritorious of diffusion through the final publication.

Despite the management difficulties related to the online learning environment in use, set up urgently for the occasion, given the impossibility of the two action leaders to guarantee the online space dedicated to the pilot, the overall results of the course appear positive. The comparison of teachers' self-assessments with respect to the difference recorded between the start-up phase and the conclusion of the course show interesting results both with respect to the maturation of the level of awareness in terms of Digital Competences, and with respect to the increase in self-perceived competence.

Suggestions to improve the learning environment, timely, pertinent and shareable, also reveal the great participation and attention with which the course was followed.

As it has been designed, and how it has been implemented, the training course developed is part of the approach to transformative learning that provides a high level of reflexivity on the part of adult, with the



aim of fostering a real change in professional practices through a review of their "Prospects of meaning". The "Prospects of meaning" constitute the selective filters at the base of our systems of perception, selection and interpretation of reality.

They act as a reference and structuring scheme through which our previous experience assimilates and transforms the new experience.

It is not a coincidence therefore that in some cases the ex-post self-assessment allows us to see lower values compared to what was declared in entry, because the transformative process passes through an overall re-elaboration of the professional self that, according to Jack Mezirow:

- a strengthened sense of the Self;
- a more critical reflection of the way in which social relations and culture have conditioned their beliefs and feelings;

"As adult learners, we are prisoners of our personal history. Although able to give meaning to our experiences, we all must start from what we have been given, and work within the horizons set by the way we see and understand that we have acquired through prior learning"(Quaglino, 2004).

However, even if it is true that the path has proved positive overall for those who started from a level of digital competence, and from previous experience of training oriented to collaboration, therefore in line with the 'perspectives of meaning' here proposed is to consider that for teachers bearers of a background of competence and digital experience more reduced duty thinking paths of accompaniment more structured.

At the conclusion of the pilot it can probably be said that this training can intercept the educational need of teachers who start from a medium-high level of digital awareness and competence, with a great propensity to invest in non-formal self-training courses. These elements are highlighted as access prerequisites for the success of the path. This means that a large part of the professional population remains outside. Therefore, it is necessary to think about adaptations to the two most important limitations detected.

The first is connected to the low awareness and digital competence necessary to move in a digital learning environment based on the model of self-learning between peers.

The second is connected to the difficulties in managing training times, which affect in particular the age group 41-50 years that, presumably, in a highly feminised professional sector is characterized by a population compressed by the difficulties of the dual role and the need for care family members. This phenomenon is even more serious in a country like Italy where welfare and family support policies are lacking.



3.5 UK

3.5.1. Summary

The UK's DECODE online course started on 28 January 2019 with 20 participants enrolled. Out of these 20 participants, 6 participated in the Introduction section, 3 participated in Task 2 but no one completed Task 3. This was mostly due to time constraints. Initially, 28 people were interested in the course but did not respond to the email consenting to share their personal details in order to create a log in. As a result, only 20 people were officially enrolled on the course and received log in details. Out of these 20 people, 15 completed the pre-course survey.

Meeting the target of at least 30 participants was difficult with the required start date being in January. There was very little time to recruit participants as teachers were on holiday in December and preparing for the exam period in January. This meant that many teachers were not accessing or responding to emails from the middle of December onwards, and had limited time to check availability with their managers and ask if they could participate in this course. In addition, many teachers stated that they were already enrolled on different training courses throughout February, so although they were interested in our course, they were unable to dedicate enough time to it – many of them asked if a second round would be available. This unfortunately meant that many of the schools contacted were unable to enrol their teachers onto the course. These other courses are often advertised months in advance so if the DECODE course was to run again, earlier advertising would be needed. Also, having the start date later in the school year or at the beginning of the school year would be better as January and early February are very busy times for UK schools. This would enable more teachers to prepare and dedicate a larger amount of time to completing the tasks.

In total, 9 participants accessed the Moodle course. The reason for over 50% of participants not logging into the platform may have been due to the platform itself and the difficulties that many UK participants experienced in obtaining access. As the Moodle platform is hosted by the Italian partners, all log in information was sent in Italian. Many participants' inboxes directed this email to the 'Junk' folder and those who saw this email in their inbox deleted it as they were not aware this was associated with the DECODE course. This resulted in many people being very confused after they received our 'Course start' email as they did not have their log in details and were therefore unable to start the course on the official start date. They all received their log in details the following day, but as the Moodle platform is hosted by the Italian partners, many of them thought the link was incorrect as it directed them to an Italian university website so did not log on.

As English is an international language, most people in the UK are not used to receiving emails in a foreign language so often ignore such correspondence. Going forward with this course, the default language used is something to consider when involving English-speaking participants as this initial confusion deterred people in completing the course. In other countries where larger proportions of the country are English speakers or are used to receiving emails and consuming English language media, this same problem may not have occurred. In addition, a few people's log in details did not work, preventing them from taking part in the course once this initial confusion had been resolved.



The course itself closely followed the template, with only minor alterations to text to make the tasks clearer. It officially started on 28 January and was projected to run for 4 weeks, ending on 25 February but due to tasks taking longer than expected to complete, the last log in date to the course was 17 April, 11 weeks after the start date. After realising that tasks were taking longer than expected to complete and recognising that there were few participants in the course, Task 3 was changed. Instead of having each group review another's learning situation, two learning situations created by the Catalan partners were provided for the group to review. Unfortunately, this task was never completed.

After the confusion of logging in, all moderators decided to send regular email updates to participants about the stages of the tasks and modules, any updates and to ask if they needed any help. This created a dialogue where participants were able to ask questions and provide feedback. Upon logging in, a couple of participants informed us that the course was at a higher level than they expected and was more time-intensive than they thought, so requested to terminate their participation. Although this reduced overall numbers of participants, this feedback is vital in developing a final course that can be useful to teachers in the UK. In future, it would be a good idea to better market the course and the required level of knowledge of ICT in teaching to reduce disappointment as well as provide a more realistic idea about how much time participants should expect to dedicate to complete the course.

Of the people who logged in, 6 introduced themselves, their interests and hopes for the course in the Introduction area. Following this Introduction task, 3 people participated in Task 1.3 which was to review provided learning situations. 2 participants provided a very detailed analysis of one of the learning situations, and upon moderator comments, provided further insight and analysis about how these could be adapted to incorporate ICT and improve overall student engagement. The third participant attempted to answer the questions but was unclear about the objective of the task so did not complete it. This shows that further explanation could have been provided and perhaps an example could be included if this course were to run again in the future. However, the 2 people who did complete the task did so to a very high standard. If we had higher numbers of participation, this task would have been very successful and could have involved insightful and meaning interaction between participants, fostering learning and an exchange of knowledge and ideas. It would also have allowed interests and ideas to be shared, enabling groups to be formed between participants with similar ideas for Task 2.

Task 2 relied on the creation of groups. Unfortunately, no participants had created their own groups so it was the moderators' responsibility to divide participants into groups. The 3 most active members were placed into the same group as they had the highest likelihood of completing the second task. The 3 other people who introduced themselves were placed into a group and all other participants were randomly divided into groups. In addition to posting these groups on the platform, everyone was informed by email about where they could find their group, what their task was and who to contact for more information if they had any questions.

Only one group started Task 2. Initially, all 3 members (the 3 who had posted in Task 1.3) were all active, discussed ideas and were very keen and enthusiastic about creating a new learning situation with ICT that they could use in their daily practice. The biggest problem, however, was organising the group itself, deciding on a time when all 3 members were available and able to work on this together.



This required significant moderator intervention. As the notification system of the Moodle platform wasn't effective, participants used email to decide on working times but were unfortunately only able to work on the platform at the same time once for a couple of minutes as each person had other work commitments. As a result, progress was very slow and although lots of ideas were presented, the group work ceased on 17 April without a completed learning situation. By this date, the course had been running for 11 weeks.

3.5.2. Main Problems and Ideas for the Future

Throughout the training process, the main problem faced was that not enough people were enrolled on the course. If larger numbers of teachers were enrolled, there would have been more interaction, encouraging others to participate in tasks. As very few people were participating in the course, there was little motivation for others to start or continue, despite encouragement from the moderators. It would perhaps have been better if there was a version of the course where participants from all partner countries could work in English. This would have created an area where a larger group of people would be interacting, encouraging less active members to join in as they could see the value of participating and learning from others in different countries.

The second major problem was the platform itself. Although Moodle supports conversation forums, it is difficult to access and doesn't allow for collaboration on documents. This may have been a large obstacle to the group task as the objective was to develop a shared document about a new learning situation and the group was unaware of how to proceed with its creation. If a tool like Google Docs was used, where ideas can be put together in one document from multiple contributors, rather than ideas simply being discussed in a group, it could have made the tasks more effective. Moodle was also ineffective at sending notifications about activity. Participants in Task 2 reported that they were unaware when someone had posted in the forum, or that notifications were received hours late – by which point it was too late for live/instantaneous conversation. Notifications were also received from the Romanian course which confused some participants. Although the Moodle platform may be useful for some group tasks, the UK piloting highlighted that an alternative online system may be more effective for encouraging productive group work.

Finally, the course was demanding in terms of time and prior knowledge needed. Many people presumed that the course would have been at a more basic level so dropped out as they didn't feel able to complete it. Additionally, the course was very time-intensive and many people were unable to work the required hours on the tasks. In the future, tasks could be shorter and simpler, requiring one hour per week as this can reasonably fit into a teacher's schedule whereas 7-10 hours per week is too much to ask. Many teachers are unwilling to complete training in their spare time so the course would need to be reviewed to fit more seamlessly into a teacher's daily work schedule.



4. Comparative analysis of pilots

In this section we will provide a comparative analysis of the pilots in order to share further insight into the current findings. To do this we will detail and highlight what we consider to be the most important results in terms of the project itself.

4.1. Sample country comparison

In this section we will focus on the comparison of the participants in the seminars in different countries. In Catalonia, 51 teachers (currently employed) participated in the seminar with a total of 47 responses received for the questionnaires. The average age of participants was 41 years old, but it must be noted that 50% of respondents were over 42 years old. In terms of gender the sample was quite balanced, with 55.3% females. 51.1 % participants were teachers in Secondary Education, however 36.2% were teachers in Primary Education, 21.3% Baccalaureate, 14.9% in Infant Education, and 10.6% in VET. Almost half of participants (49%) stated that their students were digitally competent, yet they rated their own competence lower (36%).

In Italy, the initial questionnaire was filled in by 161 teachers. Of these, 35 completed the course, with an additional 8 who completed the training, even though they only completed the final survey. **In our analysis we reported both the data relating to the 161 teachers enrolled on the platform and those of the 35 teachers who have completed the training.** It is interesting that among those who completed the course the age range between 31 and 40 years old is well represented (20%). Conversely, there was a high percentage of dropouts, for both the groups interviewed, represented by the range of 41-50 (28,6% 161 teachers; 11,4% ref. to 35 teachers). A further high percentage is represented by the range of 51-60 (55,3% 161 teachers and 57,1% ref. to 35): this reflects the profile of teachers involved in the general survey, who we can define as “digital immigrant” and who is particularly sensitive to training for the improvement of its digital competences. The majority of participants, for both the groups (52,8% of 161; 54,3% of 35) are teaching at the Secondary II grade school. The data confirms the most frequent use of ICT in high school, as confirmed by the results of the [DECODE survey](#). No teacher from the group of 35 comes from Kindergarten (0%) and only 2,9% come from VET. Similar percentages are seen in the group of 161 teachers: 0,6% from Kindergarten and 2,9% from VET.

Finland reported 47 students registered and 34 signed into the course. 15 students completed all the assignments for the course. All the participants were from the South of Finland, 13 of them were female and 2 of them were male students. All students had pedagogical competence and 9 of them had bachelor's degree and 6 had a Master's degree. Students goals and motivation to participate in the course were diverse but all of them wanted to learn more about digital learning and teaching methods. In Romania the initial questionnaire was filled in by **300 respondents** from 36 counties from Romania, including teachers with various specializations, and 57% from six counties (BC, B, IS, MS, PH, CT), and 43% from 30 different counties to those in the previous list. Finally, in the UK initially, 28 people were interested in the course but did not respond to the email consenting to share their personal details in



order to create a log in. As a result, only 20 people were officially enrolled on the course and received login details. Out of these 20 people, 15 completed the pre-course survey.

4.2. Adaptation of the training model country comparison

Firstly, we will focus on the adaptation of the training model for the pilots which will include the length of the course for each country, information related to previous online experiences for participants, educational innovation methods, and any courses they have attended in order to increase their digital skills.

In **Catalonia**, the training itself saw very few changes given that this is where the original model was created by the original DECODE team. However, one significant change was the fact that the seminar which was implemented went from 4 to 5 weeks long. Furthermore, we investigated the current level of TDC in participants. A total of 94% of participants had prior engagement with online courses/training. We also considered their reasons for partaking in the course. 72% expressed having a general interest in TDC. Also, the results showed that 53% wanted to update their professional knowledge/skill, 40% expressed a need for training in TDC and a further 40% considered it necessary to partake in shared training experiences with fellow teachers.

In comparison, in **Italy** the training was much longer with a total duration of three and a half months. The course started on December 17th and ended on March 27th, 2019 with the administration of the final questionnaire. The seminar recorded the initial interest of 161 teachers, registered on the platform within a single week, against a target of 50 members. Due to this result, the entries were closed early. Of these 43 (27%) completed the course in its entirety. We asked them for the information related to their desire to complete the course. 35 of the teachers expressed similar reasons to that of the overall group of 161 (as aforementioned for expressing initial interest): the improvement of didactic activity was dominant (70% for 161 and 82,9% for 35), while the reason for obtaining a diploma (formal certification) was the less mentioned criterion (17% for both groups). Out of the 161 respondents, 47,8% said they had achieved an ECDL (European Computer Driving License) certification previously. 40% of the 35 who completed the course also have an ECDL certification. Moreover, in consideration of both groups (161 and 35) we looked at their previous online learning experiences. 91,4% said they were involved in this type of learning prior the DECODE course. Related to the group of 35 teachers who completed the course, a higher percentage of them (91,4%) stated that they have participated in other online learning experiences and only 40% of them declared that they have certified their ICT competences. These data corroborate the overall feedback of the general survey where the majority have not yet obtained a certification. Regarding the different types of online experiences, the two groups (161 and 35) answered saying that they used both collaborative and individual work (62,2% and 65,5%).

In **Finland** the course began in November 2018 and ended in February 2019. The course was created on Omnia's Moodle platform instead of planned Link campus Moodle. The training course was copied from Omnia's platform to Link campus platform regularly. Also, the duration of the course was extended from 1 month to 2 months to give students a chance



to complete the learning assignments. However, Finland provided less information in comparison to that of Spain and Italy. Almost all respondents had some sort of previous web-based training, but it appears that it was more blended in focus given that it was undertaken via web training and classroom training. Furthermore, the level of digital competence throughout the course was considered from average to very high in all competence areas.

The **UK's** DECODE online course started on 28 January 2019 with 28 participants initially interested in participating. However, due to the fact that the course began in January, attrition rates were high and only 3 started task 2, but no one completed task 2 or the entire course. Despite the high interest in the course, many teachers stated that they were already enrolled on different training courses throughout February, so although they were interested in our course, they were unable to dedicate enough time to it. Due to the low number no further information was obtained in relation to their prior experiences, educational innovation methods and/or relevant courses they may have attended previously.

Finally, we would like to highlight the same information for **Romania**. The total number of people initially interested in the course was 300, with 70 maintaining their option to participate in the course. Of the 300, 77% enrolled to improve didactic activity, 63.3% stated their motivation for registration as training needs in ICT, 62.7% of respondents indicated that improving professional skills was their main reason for enrollment, 54.3% of respondents enrolled in the course because they were interested in the subject, 30% stated their interest stemmed from the need to obtain a diploma/formal certification, 34.7% indicated they were interested in sharing experiences with other colleagues. The percentage of those who enrolled in the course for other reasons (63.3%) is a potential indicator of the diversification of teachers' expectations regarding training programs. For the 70 teachers who decided to participate in the course, they chose similar reasons to that of the larger group for participating. Conversely, they did not choose the 'others' option as the big group did. In regards to existing digital competences, of the group of 300 participants, 24% said they had some experience and certification at the time of completing the initial questionnaire. Similarly, 65.3% of the 300 had previous online learning experiences prior to the DECODE course. Out of those who participated in online training experiences, teachers over 50 declared the highest percentage of participation in such activities prior to enrolling in the course (73%). Young teachers (19-30 years) declared the lowest percentage of participation in such activities (35.7%). In the group of 70 teachers who took part in the course, 80% stated that they had previously participated in online learning experiences. Similarly, 30% stated they had already certified their ICT competences previously.

4.3. Reasons for enrolment country comparison

The primary objective of this seminar was to encourage critical thinking and self-reflection in relation to TDC. As such, it was hoped that the desire to further self-knowledge in the field was the main reason for participation in the course. Below we will highlight the different reasons for enrolment as mentioned from participants in each course in each country.



In Catalonia, participants demonstrated a desire to develop '**Design of training activities (activities, resources and evaluation) using digital technologies**', with approximately 70% indicating their desire to do so. In Italy, the reasons for enrolment of the 35 teachers who maintained their option to participate to the course were similar to the reasons expressed by the initial group of 161: the improvement of didactic activity was dominant (70% for 161 and 82,9% for 35), while the reason for obtaining a diploma (formal certification) was the less mentioned criterion (17% for both groups). Similarly, in Romania, in the course for the 300 initial respondents, the reason for the **improvement of didactic activity** was dominant for most of the teachers (77%), followed by reasons for **training needs on ICT** (63.3%), updating / improving the professional skills (62.7%). About half of respondents say they enrolled in the course because they were interested in the subject (54.3%). The need to **obtain a diploma** (formal certification) and the **sharing of experience with other colleagues** were expressed by the lowest number of respondents (30% and 34.7%). The percentage of those who enrolled in the course for **other reasons** (63.3%) is a potential indicator of the diversification of teachers' expectations regarding training programs. Considering the characteristics of their contexts explained in previous sections of this report, both the UK and Finland could not provide information regarding participants' needs and reasons for enrolling in the course.

4.4. Self-Perception of Digital Competence

In this section we will compare participants from each country on their self-perception of Digital Competence. This is very relevant as one of the primary objectives of the seminar was to encourage critical thinking and self-reflection in relation to TDC.

Firstly, we would like to highlight the information provided from the participants in the **Catalonian** cohort. In order to investigate this, we evaluated the difference between participants' self-perception of their TCD development and conducted a comparative analysis on this alongside the aforementioned competency descriptors. For the results section, we included only those participants who considered themselves as having a high or very high rating of the seminar. We would like to draw attention to the following results in relation to **Dimension 1 which was the 'Design of training activities (activities, resources and evaluation) using digital technologies**. 70% of participants stated that they had a high level of development for 4 of 5 descriptors in this dimension:

- Incorporation of students' digital competency in the educational activity (72%)
- Use of digital technologies in the design of activities or learning environments (70%)
- Definition of the monitoring strategy and evaluation methodology of students in the teaching-learning process (self and co-evaluation) (68%)
- Critical search and selection of digital resources appropriate to the context and specific learning objectives (68%)
- Application of innovative methodologies using digital technologies, more than half of the participants (75%).



Moreover, the seminar saw an increase in competence in many of the other competences which we provide below:

- **Dimension 2: “Organization and management of information, resources and digital spaces,”** There was an increase in the following descriptors: Adequate application of environment rules and digital spaces (appropriate content, language, correct management of the digital space - 66%), Optimization of digital information management (57%).
- **Dimension 3: “Communication and Collaboration using digital technology”**, contains the descriptor with the highest development in the seminar: 79% of participants reported a high improvement in the Use of digital technology for communication with colleagues. However, only 45% of participants noted a high improvement for the other descriptor mentioned in this dimension, “Participation in education networks in digital environments”.
- **Dimension 4: Ethics and Digital Citizenship.** 60% of participants stated they had further developed the descriptor awareness and presence of one's own digital identity in all interactions in the network. Similarly, a 53% increase was seen for licenses in the use of digital resources.
- **Dimension 5: Professional Development.** the majority of participants (66%) demonstrated a high level of development of the descriptor Reflective practice of professional activity applying digital technologies. In contrast, only 26% rated a high development of the descriptor Professional digital profile active in different networks and internally in Moodle Platform.

On a final note, we would like to focus on the teachers’ perception regarding their improvement level of TDC dimensions. We would like to reiterate the fact that across all dimensions addressed in the seminar, participants saw growth in their perceptions of the respective competences.

Now we turn to the results provided from the Italian participants. **The analysis involved the 35 teachers who completed the course and filled out both the final and initial questionnaire.** The question was: *What do you think is your level of methodological digital competence?* The data shows in the initial survey participants expressed a medium level of TDC competences (46%) which decreased after completion of the course of 0.6%. In contrast, those who confirmed in the initial questionnaire to have high skills (34%) noted an improvement (from 34% to 43%).

- In relation to the **use of digital technologies** the respondents who considered themselves as having high competences (31,4%) at the end of the course felt that they improved upon this (42,9%, +8,5%). However, those who initially stated they had high competences on the ‘application of innovating methodologies (42.9%) dropped by 20% upon completion of the course, most likely due to the fact that they realized during the course that their skills were not as high as they had thought. We saw the opposite direction of results in those who declared to have very high competences: in the initial survey the percentage of them who selected low competence, improved it at the end of the course (28,6%) with a + 27,9%.
- For **finding and critically selecting of digital resources** the teachers who responded to having high (28,6%) and very high (17,1%) involved in the course path improved these competences 39,5% and 18.6%. For this competence, those who stated in the initial survey to



have high competences (48,6%) in the final survey expressed not having it (37,1%). It is interesting to note that those who affirmed in the initial questionnaire to not having very high competence (0%): in the final survey felt that they had improved it by 20%.

- The **application of rules to environments and digital spaces** presents a little increase for who those who declared to have high percentage (from 40% to 54,3%) and for those who declared to have very high competences in this improve also of 14.3% from 2,9%.
- The percentage of respondents who affirmed to have very high competence on **optimization of the management of digital information** shows an increase of + 11,4%.
- The use of **digital technologies to communicate with colleagues** shows an increase of 14% for who asserted in the initial survey to possess very high competences about it. In the data a little decrease appears between who responded to have high competences in the initial survey and final survey (from 48.6% to 40%)
- For **participation in education networks in digital environments** we can see as the perception of competences increase for teachers who declared to have high (from 25.7% to 34.3%) and very high competences (from 2.9% to 11,4%).
- The data about the **joint construction of knowledge based on digital technologies** shows an increase only for who declared to have very high competences about it (from 8,6% to 14,3%).
- The perception of teachers who affirmed to have high competences related to the **use of digital resources** decrease form 42,9% to 34,3%. For those who declared to have very high skills the percentage increased from 11,4% to 17,1%.
- The **awareness and integration skills of teachers about the digital identity** presents the same percentages for both initial and final survey (high: 40%; very high: 11,4%)
- The **activation of professional profile in different networks and internally to the centre** presents a decrease of 11,4% for who affirmed to have, before the course, high competence in this field (40%). The percentage increased at the end of the course, from 0 to 14,3%.

Thirdly we consider these skills in relation to the **Romanian** cohort. Regarding the self-assessment of the level of **digital competences** of the initial 300 teachers who responded to the initial questionnaire, namely the "ability to access and transfer knowledge, strategies, skills and attitudes related to ICT in real-life situations in professional practice" (*Teachers' Digital Competence in Catalonia*), **young teachers** aged under 40 believe that they have 80% of the necessary digital skills and the percentage decreases to 60% for those aged between 31 and 40 years. For the 300 teachers, **high** levels of development of specific digital competences (68%) are recorded in the field of:

- **communication with colleagues** (in the virtual space),
- **searching and selecting resources** for the activity with pupils (67.2%)
- **digital identity management online** (64.8%).



The **lowest** levels of development of specific digital competences are recorded in the field of

- **student assessment** (57.2%),
- **application of innovative methodologies with digital support** (57.6%)
- **activation of a digital profile** (57.8%).

We then considered the self-perceived level of digital competence in relation to the different school levels amongst the initial 300 teachers.

- Primary school teachers declare that they have the **highest** levels of development of 13 out of the 14 listed competencies compared to peers at other school levels, with higher degree of ownership in the **use of digital technologies in communication with peers** (74.4%), both of all their competences and of all the school levels investigated.
- The **lowest** levels of development of self-assessed digital competences were seen in pre-school teachers compared to teachers at other levels of teaching (8 out of 14 highlighted skills), with the lowest level of competencies in terms of **incorporating of digital competences of pupils in educational activities** (52,4%).
- For teachers from high school / professional stream, similar to the teachers from the other school levels, they identified as having the **highest** levels of competencies development in the use of **digital technologies in communication with peers** (68,2%). Compared to teachers from other school levels, they say that they have a higher degree of competencies to **incorporate the digital competencies of the pupils in their educational activities** (61,2%, compared to 52,4%, 57,1% and 60,4% of the teachers at the other levels teaching).

However, as aforementioned, the 300 teachers initially interested in completing the course did not finish it. Therefore, it is important for us to provide the information related to the self-perception of the digital competences for the 70 teachers who did complete the course. After the finalization of the DECODE course, the 70 teachers who participated re-evaluated their level of competencies. There was a certain level of improvement for all competencies and for all categories with teachers declaring that they have 68,3% of the necessary digital skills before the course and 77,1% after the course. Other important results include:

- Prior to participating in the course, a higher percentage of teachers self-evaluated their level of competencies at the medium level, while at the end of the course a higher percentage of teachers from all categories self-evaluated their competencies as high and very high across age and school level.
- Young teachers (19-40 years), were the only age group who self-evaluated the initial competencies below the medium evaluated level of the whole group (65,7% in comparison to



68,3%), and at the end of the course declared the level of competencies above the medium evaluated level of the whole group (81,4% in comparison with 77,1%).

- High school teachers, the only group who self-evaluated the initial competencies above the medium evaluated level of the whole group (71,4% in comparison to 68,3%), then evaluated their level of competencies above the medium evaluated level of the whole group at the end of the course

Moreover, the specific competencies self-evaluated in the highest percentage at the beginning of the course are:

- using digital technology used in communication with peers (70,9%)
- searching and critical selection of proper resources for the context and the specific learning objectives (68,6%)
- awareness and management of own digital identity in online interactions (68%).

The lowest percentage can be seen for the competencies of

- using innovative methodologies through digital technologies (60%)
- defining the monitoring and assessment strategy of pupils in the teaching-learning process (60,3%).

By the end of the course the highest percentage related to the level of the competencies' development was declared the same competency as in the beginning of the course:

- using digital technology used in communication with peers (79,1%, with an increase of 8,2%),

Similarly, the lowest percentage remained for

- using innovative methodologies through digital technologies (72,9%).

Most notably, for each competence included in the survey we saw an increase in the level of development at the final evaluation in comparison to the initial survey.

The highest increase for the competencies were:

- facilitation of working together in building knowledge through digital technologies (14,6%)



- defining the monitoring and assessment strategy of pupils in the teaching-learning process (14%)

Conversely, the lowest increase was seen for:

- awareness and management of own digital identity in online interactions (6,3%)
- searching and critical selection of proper resources for the context and the specific learning objectives (6,8%).

For both the UK and Finland, no data was obtained related to the self-perception of digital competences and therefore cannot be addressed here.

4.4 Course evaluation country comparison

This section is dedicated to the different evaluations as provided by each member country.

In **Catalonia**, a continuous evaluation approach was undertaken with 100% of participants stating that they were satisfied with the course and felt that objectives were met. Of importance is the fact that 89% of participants also stated that collaborative learning was an important factor in the development of the TDC skills. This also ensured that all learning processes were accounted for. The evaluation process therefore requires the active participation of the participants through both self and co-evaluation. The resources were consulted on average by 31 people, of which 29 (96%) considered them slightly, quite or very useful to participate in the seminar. The most consulted resource according to 91% of the results was How to design learning situations that promote the digital competency of students. This resource was scored as useful by all participants who consulted it. Moreover, the other two resources which were consulted, by 83% of participants were Orientations for virtual debates and teacher digital competence. Both resources were rated useful by 90% and 100% of the participants who used them respectively. We also would like to highlight the feedback regarding the teacher role in the process. 98% of participants said that the orientations were clear and that their communication was very useful for organizing the work. 94% of participants felt that the teacher role was crucial for the development of the seminar and subsequent feedback related to bettering their work throughout the seminar. Finally, it is useful to draw attention to the transferability of the course. 87% of participants who consulted the resources felt that they were extremely transferable to their teaching. A further 89% stated that they would actively transfer what they learned to their colleagues, whilst 93% would recommend the seminar to them.

In terms of the **Italian** participation, 35 teachers responded to the questions in relation to the evaluation of the course, of which all completed the entire course. 67.5% of the respondents stated that the objectives of the course itself were slightly clear to extremely clear. Furthermore, the descriptions of the activities were clear for 39,5% of teachers and slightly clear for 30,2%. These are impressive figures given that 46,5% of teachers dedicated from 20 to 30 hours to the course; with 25,6%, from 30 to 40 hours respectively. Based on this, the Italian cohort provided information as to what they considered the



ideal timeframe to be for the course. 30.2% stated that the ideal duration for this seminar is from two months to two and a half; with 27,9% saying that the ideal duration is less: from one month and a half to two months. 69.7% of the respondents stated that the evaluation criteria of the course itself were slightly clear to extremely clear.

In terms of methodology, there were many useful insights found in the data. For example, the online collaborative work helped teachers to develop Teacher Digital Competence for 25,6% of the participants.; 41,9% slightly agree with the statement. The challenge-based methodology helped achieve the objectives of the seminar for 34,9% of participants. The seminar has made teachers aware of Teacher Digital Competence for 20,9%. The course certainly had the effect of favoring the growth of interest on these issues and the development of a training needs self-analysis. 86,1% of teachers stated that they intend to continue training to acquire additional digital skills. Alongside this, the teacher's feedback helped participants improve their work for the seminar for 37,2% of respondents. Teacher communication was useful for organizing participants work for 44,2% of respondents. Communication competence was more appreciated than specific feedback for the work improvement. The role of the teacher was a key element in the seminar for 34,9% of respondents with 41.9% of respondents stating that the teacher's orientations were clear. As such, 39.5% of teachers intend to share their seminar experience with their colleagues and 37.2% of them would recommend the seminar to a colleague. The most consulted resources of the seminar were:

- guidelines on virtual debates
- digital communication and collaboration
- digital citizenship.

The satisfaction about the contents of the courses attended is particularly high: 81% for the large group of 161 and 96.6% for the group of 35.. The majority of the 35 teachers who completed the course mentioned experiencing technological problems. The most interesting data come from Infrastructural issues, for which 42,9% declared to encountering problems constantly. Logistical problems are underlined by 48,6%, the same percentage for who confirmed to have organizational and management issues. Instead the inadequacy of specific training (48,6%) and lack of educational materials and media is rarely perceived (40%). A problem detected almost by 63% (always + sometimes) is the resistance of colleagues and the lack of cooperation between teachers (57.2%). This increase in resistance is physiological in subjects with a lower level of digital competence who experienced problems related to the infrastructural, organizational, management dimension.

For **Finland**, quantitative feedback was not provided by the associated team. Nevertheless, respondents evaluated the course resources benefits achieving course challenges and level of suitability for teaching use were useful or even very useful. Assessment criterion were clear for two of the respondents and for other respondents they partly agreed or disagreed with the statement as well as with the statement considering teachers feedback helped me to work better during a course. They mentioned that the teacher role was to guide and support students during the course, but they did not receive feedback on its benefits. In terms of the methodology, the Finnish team highlighted that the course was based on the use of videos, weblinks, discussion groups, group work, questionnaires, tests and e-mails. Classroom teaching was provided twice; in the beginning of the course and at the end of



the course. Overall methodology was very student centered and required independent studying attitude from students. The course included 6 modules: 1) Digital me and netiquette, 2) Making digital material, 3) Online communities and communication, 4) Swarm intelligence and team learning, 5) Feedback and online evaluation and 6) English learning materials. Each learning module included learning material and tips for carrying out learning assignments. Most of the respondents agreed that course learning goals were clear, and descriptions of functions were clear but some of them partly disagree. Respondents use of time for studying the course was quite diverse: 2 of them used less than 20 hours, one student used from 20 to 30 hours and two of the students used more than 40 hours. Respondents suggestions for course length was also quite diverse: from 1 month to over 2,5 months. Respondents evaluated the course resources benefits achieving course challenges and level of suitability for teaching use were useful or even very useful. Assessment criteria were clear for two of the respondents and for other respondents they partly agreed or disagreed with the statement as well as with the statement considering teachers feedback helped me to work better during a course.

In **Romania**, almost all participants who completed the course stated that this course managed to stimulate their interest. The clarity and accuracy of the communication seems to have been the strength of the course, considering that for almost 90% of the participants, the course objectives and the evaluation criteria were clear from the start, 99% consider that the tutor's instructions were clear, and 94% felt that the description of the activities was also clear. Although less than 60% of respondents believe that the role of tutors was a key element of the course, however, 90% and above agree that the feedback received from the tutors and their communication helped them to improve and organize the work of the course. A lower percentage thinks that the challenge-based approach helped to achieve the course objectives. In relation to the final goal of the course, 80% and above believe that online collaborative work helped them to develop their digital didactic skills and that this course has helped them become aware of the digital competences of teachers. 77% intend to continue training in the digital competencies of teachers.

Over half of respondents dedicated less than 20 hours to complete their activities. On average of those who passed the evaluation had an average intensity of involvement in the course between 30 - 40 hours (roughly a quarter of participants). Based on those who completed the course, one month appeared to be appropriate for most participants. However, over a quarter of participants would like to have a duration of at least one month/month and a half, or longer at two to two and a half months. Finally, in terms of the resources, a large majority of them consulted the resources on a regular basis. Results showed that the most consulted resources were related to Digital Communication and Collaboration, ICT use in education, and the Design of learning situations. Specifically of the eight support materials available, the use of ICT in education was highly valued, both in terms of its usefulness in addressing the challenges of the course and its applicability in the current didactic work. Conversely, Digital Citizenship Resources and Virtual Discussion Guidelines were the least consulted and were considered more useful for their utility in solving course tasks and less for their relevance to current didactic activity.

Due to the low participation number of the **UK** training, no feedback was provided regarding the evaluation of the course itself.



5. Conclusion

Considering that Digital Competence is a key competence for the actual citizens, it must be present in all areas of the society, especially in education (Ilomäki, Paavola, Lakkala, & Kantosalo, 2016), because it is the best way to assure that citizens can take advantage of technology in their everyday activities (both personal and professional). But DC cannot be a part of the educational system if teachers don't train themselves to acquire it and integrate it in their professional practices. (Krumsvik, 2014a; Lund, Furberg, Bakken, & Engelién, 2014). However, the integration of DC requires not only the application of technology in teaching activities: it requires a change in teaching methodology, planning and conception, in order to make technology a resource that enhances students' learning, placing pedagogy before technology. (Generalitat de Catalunya, 2018; Instefjord & Munthe, 2017).

Although TDC is considered from an international perspective, most of the research is situated in pre-service teachers' training (Gudmundsdóttir & Hatlevik, 2018; Instefjord & Munthe, 2017; Krumsvik, 2014b; Lund et al., 2014; Maderick, Zhang, Hartley, & Marchand, 2015; Ottestad, Kelentrić, & Gudmundsdóttir, 2014; Rossi, Bordin, & De Ciccio, 2016; Svensson & Baelo, 2015; Tømte, 2013), so there's a lack of analysis of its presence in-service teachers' training. Considering this problem, the DECODE training can be a model to help teachers to acquire it. As can be seen in the first sections of this report, is important to highlight the subsequent characteristics of this training model:

- In order to be motivating, it was developed considering the Challenge-Based learning methodology (Fidalgo Blanco, Sein-Echaluce Lacleta, & García Peñalvo, 2017; Johnson, Smith, Smythe, & Varon, 2009), in which participants had to overcome three challenges in order to design a learning situation (or best practice) using ICT to promote students' Digital Competence.
- Considering that collaboration is one of the most important areas of TDC (Generalitat de Catalunya, 2018; Redecker et al., 2017) and the experience of the designers of the training on online collaborative learning (Guitert et al., 2013; Guitert et al., 2003; Romeu, Romero, Pérez-Mateo, & Guitert, 2012), the main activities of the training are designed to be developed collaboratively.
- In order to offer a training model that assures the integration of TDC for their professional development, it is based on practice, because the learning situations that participants had to design must be applied to their teaching practices.
- And, considering that the training model was designed to be applied in different countries and contexts, to increase the number of participants and to promote collaboration, it was developed to be applied fully online².

One of the foundations of the proposed training model is teaching presence considering its importance in online learning (Garrison & Cleveland-Innes, 2005; Shea, Sau Li, & Pickett, 2006): during the training, online teachers communicated with students giving them instructions on the teaching board, responding directly to doubts in the course forum or by e-mail and providing feedback at the end of

² Although the training model was designed to be applied fully online, Finland partners include two f2f sessions.



each challenge. Although it is important to highlight that in the case of Finnish pilot, the feedback provided was based on peer-feedback.

From the Analysis of the results of the different national reports, we can conclude that, in general terms, the training model designed for the project can be considered adequate to help in-service teachers to acquire the Digital Competence. However, as mentioned by all partners, when it was applied to the different context, we can see difficulties for participant engagement. Based on the analysis of all the partners in their National Reports, the problem for participants' engagement and participation produced high dropout rates. This fact can be explained by some main causes that can be considered as vectors of improvement:

- The time to develop the pilots that was too short: it was originally conceived to be developed in 30 hours and an agreement across countries was made to extend the overall training period from one month to two/two and a half months.
- The technical difficulties with Moodle platform (participants' login): regarding that, in most cases, the pilots were developed in Link Campus University's Moodle, the access to the platform depended on one partner that introduced manually all the participants in each course. In addition, the email that participants received to sign on the platform were in Italian and it was confusing for most of the participants that were not Italian speakers. This issue could be overcome if each country could have their own Moodle or if another platform more user-friendly was selected.
- Some of the reports pointed out a lack of clarity in the instructions of the activities. Maybe that could be caused by the fact that the seminar was initially designed in Catalan, then translated into English and, finally, translated into each country's language. Even though the Catalan partners provided guidelines (teachers' board messages and assessment guidelines) the design of a document containing teaching guidelines for the implementation of the seminar or the development of a training for the pilots' instructors could be good solutions for this issue. Another suggestion in order to help participants to understand the training assignments is the addition of a chronogram at the beginning of the seminar and a check-list for each of the challenges.
- Most of the partners registered difficulties in forming and managing the group work during the development of the pilots. This issue could be improved by giving more time to form the groups and, as suggested in the previous point, the development of a training for instructors that could gather UOC's experience on collaborative online teaching and learning.
- Some partners missed the use of a tool to allow participants to write collaboratively at the same time. Although the Catalan pilot promoted the use of Google Drive and Google Documents, it seems that not all partners used it during the pilots. So, it would be useful to add guidelines for the use of these tools during the training.
- Some partners pointed out the need for a diversification of communication methods, such as tutorials, webinars, interactive presentations, along with non-textual in-depth resources in order to make the work environment more effective.



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7. Annex

7.1. Initial Survey

Why did you enroll this seminar?*

You can select more than one option.

- To respond to my training needs about this subject
- Because I am interested in this subject
- To improve my teaching practice
- For professional update
- To share experiences with other teachers
- To get a certification
- Other:

What do you think is your level of instrumental digital competence*?

* “Capacity to mobilise and transfer their knowledge, strategies, abilities and attitudes regarding ICT to real situations in their professional practice” Source: [Teachers' Digital Competence in Catalonia](#)

Choose among **one** of the following answers:

- Very low
- Low
- Medium
- High
- Very High

What do you think is your level of methodological digital competence*?

* Digital competence regarding didactic and methodological skills.

Choose an answer for one of each items of the following list:

	Very low	Low	Medium	High	Very high
Use of digital technologies in the design of activities or learning situations					
Application of innovative methodologies with the use of digital technologies					
Definition of the strategy for students' monitoring and assessment in the teaching-learning process (self- and co-assessment)					
Search and critical selection of digital resources appropriate to the context and specific objective of learning					
Incorporation of the students' digital competence to the educational activity					
Appropriate application of the rules of environments and digital spaces (appropriate content, language, correct management of digital spaces)					
Optimization of the management of digital information					
Use of digital technologies to communicate with peers					
Participation in educational networks in digital environments					
Fostering of joint construction of knowledge through digital					



technologies					
Respect of the licenses in the use of digital resources					
Awareness and presence of their own digital identity in all online interactions					
Reflective practice on professional activity applying digital technologies					
Activation of Professional digital profile in different networks and in the own educational context.					

Do you have any accreditations on Digital competence (here partners have to specify their national certifications if they have any)?

Region?

Select only **one** option

Each partner can specify their regions

Gender

- Female
- Male

Age

In which educational level are you teaching?

Each partner can specify their national educational levels

7.2. Final Survey

1. What level of instrumental digital competence do you think you have?

* "The combination of knowledge, skills and attitudes in the field of information and communication technologies that people they deploy in real situations to achieve determined objectives with efficiency and efficiency. "Source: Teaching digital competence of teachers of Catalonia

(<http://ensenyament.gencat.cat/web/.content/home/departament/publicacions/monografies/com-digital-docente/competencia-digital-docent.pdf>)

Very low

Low

Medium

High

Very high

What level of digital methodological competence do you think you have?

Digital competence regarding didactic and methodological skills

Very low - Low - Medium - High - Very high

Use of digital technologies in the design of activities or learning situations

Application of innovative methodologies with the use of digital technologies



Define the strategy for monitoring and evaluating students in the teaching-learning process (self and co-evaluation)

Search and selection of critical digital resources appropriate to the context and specific objective of learning

Incorporation of the digital competence of the students to the activity and ducativa

proper application of the rules of digital environments and spaces (appropriate content, language, proper management of digital spaces)

Optimization of the management of digital information

use of digital technologies to communicate with

co-participationin education networks digital environments

Promotion of the joint construction of knowledge from digital technologies

Regarding licenses in the use of digital resources

Awareness and presence of the digital identity in all interactions in the network

Reflexive practice on professional activity applying the digital technologiesdigital

professionalprofile active in different networks and internally

Rate from 1 to 6 the degree of digital maturity of your center, with 1 being the lowest value and 6 the highest, with respect to: *

1 - Very little

mature 2 3 4 5

6 - Very mature

Technology infrastructure

Digital skills of teachers

Digital competence of students

You have had Other experiences of online training prior to the realization of this seminar? *

Select only one of the following:

Yes No

These previous experiences included: *Answer this question only if the following conditions are met: The answer was 'Yes' to the question '4 [exppreviformlinia]' (You have had other training experiences on line prior to the completion of this seminar?)

Select only one of the following:

Individual

work Collaborative work

Both

Indicate the degree of agreement or disagreement with the following statements: *

Choose the appropriate answer for each entry:

Completely in disagree Disagree

Completely

agree

On-line collaborative work helped me develop the CDD

The seminar helped me to become aware of the CDD

I intend to continue to train at the CDDCDD

Experience experienced in theI will take the seminar to the students of the center

The methodology for challenges has facilitated me the achievement of the objectives of this seminar

The role of the teacher has become a key element for developing for the seminar

The objectives of the seminar have been clear from the beginning

The statements of the activities were understandable

The orientations of the teaching staff were clear



The seminar was stimulating and interesting. It would
recommend the seminar to a company

Lightlydisagreeing

slightlydisagree

Slightly disagree

Slightly

Slightly

Slightly

agree

agree

agree

what is the workload you supposed to do the three challenges of the seminar (in hours)?

Select only one of the following:

Less than 20 hours

From 20 to 25 hours

From 25 to 30 hours

From 30 to 35 hours

From 35 to 40 hours

From 40 to 45 hours

Over 45 hours

Considering the work load you have, It has meant the seminar, what is the ideal duration to
perform it? *

Select only one of the following:

Less than two weeks

From two weeks to a month

From one month to a month and a half

From month to a half to two months

From two months to two months and a half

More than two and a half months

Select the resources that you have consulted throughout the seminar:

Select all that correspond:

Orientations on virtual debates (Challenge 1)

Communication and collaboration on Network (challenge 1)

Digital Civism (Challenge 1)

How to Design Learning Situations That Promote Digital Competence The Student
(challenge 2)

Selection and creation of digital resources for designing activities and didactic planning
(challenge 2)

Tips for Organizing Digital Information (challenge 2)

Assessment in online educational contexts (challenge 2)

Digital Teaching Competence (challenge 3)

Values the utility of the following resources provided to carry out thechallenges seminar's
and indicates its level of applicability in your educational practice: *

Answer this question only if they meet the The following conditions are: count

(valorarecursoschoice_SQ001

(/surveys/index.php/admin/questions/sa/view/surveyid/759231/gid/27/qid/1649),

valorarecursoschoice_SQ002 (/surveys/index.php/admin/questions/sa / view / surveyid /
759231 / gid / 27 / qid / 1649), evaluate courseschoice_SQ003

(/surveys/index.php/admin/questions/sa/view/surveyid/759231/gid/27/qid/1649), evaluate
courseschoice_SQ004 (/ surveys

/index.php/admin/questions/sa/view/surveyid/759231/gid/27/qid/1649), evaluate

courseschoice_SQ005 (/surveys/index.php/admin/questions/sa/view/surveyid/759231/gid/27



/qid / 1649), evaluate courseschoice_SQ006
(/surveys/index.php/admin/questions/sa/view/surveyid/759231/gid/27/qid/1649), evaluate
courseschoice_SQ007 (/surveys/index.php/admin/questions/sa / view / surveyid / 759231 /
gid / 27 / qid / 1649), evaluate courseschoice_SQ008
(/surveys/index.php/admin/questions/sa/view/surveyid/759231/gid/27/qid/1649))> 0
Choose the Answer is appropriate for each entry: Answer only this question for the items you
selected in the question Orarecursoschoice ('Select the resources you have consulted
throughout the seminar:') Respond only this question for the items you did not select in the
question valorarecursoschoice ('Select the resources you have consulted throughout the
seminar:')
Utility to carry outseminarthe challenges of
Applicabilityonyour educational practice
Nothing
useful
Slightly useful
Not useful
useful enough
strength
helpful
Very helpful
Very low low
Somewhatlow
highhighSlightly
Very high
{valorarecursoschoice_SQ001.question
valorarecursoschoice_SQ002.question}}
{}
{valorarecursoschoice_SQ003.questionvalorarecursoschoice_SQ004 .question
valorarecursoschoice_SQ005.question}}
{}
{valorarecursoschoice_SQ006.questionvalorarecursoschoice_SQ007.question
valorarecursoschoice_SQ008.question}}
Indicates the level of agreement or disagreement with the following statements:
Choose the appropriate response for each entry:
Completely disagree disagree
Slightly disagree
Slightly
agree Agree
Co fully
in agreement
The evaluation criteria were clearly defined in advance
The teacher's feedback helped me improve my work within the seminar
The teacher's communication was helpful in organizing my work
What suggestions would you be doing to improve the seminar?
Write the answer here:
Comment on anything you could not say in this survey.
Write the answer here:
Thank you!
Send the survey Thank you very much for completing this survey.