Erasmus+

ONLINE
4EDU

Guidelines for implementation of
Online collaboration
methods and tools
Training and testing system

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Introduction

The project "Online4EDU"

Information and Communication Technologies (ICT) nowadays have become an integral part of everyday life and economic activity and are used by almost everyone. Accordingly digital literacy is essential for a variety of purposes - including employment, learning, communication, and entertainment. The European Commission has recognized the fact that „digital technology is transforming almost every aspect of our public, private or work life. For every individual - the worker, the learner, and the citizen - the natural consequence of technological innovation is the quest for new types of skills. Yet skills development does not come about as fast as technological development".[1]

The field of education - teaching, learning and research - has been affected by ICTs as well. The Digital Agenda for Europe[2] initiative defines the enhancement of digital literacy and skills as one of its main pillars and promotes the implementation of long-term e-skills and digital literacy policies.

ICT provides a variety of tools that can open up new possibilities in the classroom. They can enrich school lessons, help tailor the educational process to individual students' needs, and can also provide learners with the crucial digital competences needed in our knowledge-based economy.

As it has been stated in European Commission research,[3] most European countries have made significant investments over the last years with a view to ensuring universal access to ICT, with considerable success. The solution to an effective use of ICT in education, however, is not technology itself. The focus of today's policy in the field should now move to advancing our understanding of how the new technologies are and can be used in schools to support learning, and what are the barriers to success.

In order to integrate digital tools into schools, teachers not only need to know online tools but also need to be educated in applying them in their lessons and sharing this knowledge. Online collaboration tools for teachers can and should be beneficial. Cloud data storage, wikis and web-based word

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[1] https://ec.europa.eu/digital-single-market/en/grand-coalition-digital-jobs

[2] Digital Agenda for Europe, http://eur-lex.europa.eu/legal-content/EN/TXT/?uri=URISERV%3Asi0016

[3] Key Data on Learning and Innovation thtough ICT at School in Europe 2011, http://eacea.ec.europa.eu/education/eurydice/documents/key_data_series/129en.pdf, p.3.

processing and spreadsheet tools support the preparation of learning material with other teachers online. The organization, structure and stimulation of lessons enable students to use those tools independently and in a responsible way. Moreover, usage of collaborative tools greatly enhances the pedagogical process. Using Virtual Learning Environments that offer learning materials to students and social media solutions offering further interaction and support opportunities for students should become standard tools of every teacher's and VET specialist's job. Their students will then use collaborative tools for group research or projects. This can be particularly useful for students collaborating on shared files or using mobile technologies to stay in touch with research partners. Digital competences and online collaboration skills nowadays is a must in the education system, and availability of skilled teachers is the first step in educating young people to be ready for job and further education.

For these reasons the project "Introducing Online Collaboration Methods and tools in education" (Online4EDU) was developed and implemented. The project was funded by the European Union Erasmus+ programme and implemented by the Latvian Information and Communications Technology Association (LIKTA) in collaboration with partners: BCS Koolitus (Estonia), ECDL Foundation (Ireland), Stiftung Digitale Chancen (Germany) and

public institution "Information Technologies Institute" (Lithuania) from September 2014 till the end of August 2016.

The main aim of the project "Online4EDU" is to facilitate the development of teachers' digital skills, including the ability to use online collaboration and teaching technologies, and to support teachers in applying more digital media in everyday school life. Online collaboration tools can thereby enrich teaching and learning in all school subjects, and help teachers to find, create and organize new and up-to-date learning materials.

The project team applied a blended learning concept that facilitates online collaboration tools development for school teachers of primary, lower and upper secondary and vocational schools.

The main tools used in the training process are blended training materials and an online training platform. Partner organizations developed training materials that correlate with the pan-European ECDL certification module "Online Collaboration"[4]. The developed program and the materials have been piloted in four countries and on the basis of this experience these guidelines have been developed.

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[4] http://www.ecdl.org/programmes/index.jsp?p=2928&n=2948

Who are these guidelines meant for?

The present guidelines are meant for new actors - to introduce the target audience and stakeholders to project outputs, best practices of piloting, and a methodology of applying the tools for teacher training, testing and certification. They are addressed to organizations that are interested in adapting and using the developed material to fulfil the constant and increasing demand of teachers for new ICT skills and competences: school management, teachers' associations, organizations responsible for teachers' skills development and certification, adult education centres, telecentres, state agencies and offices, and Ministries of Education.

Aims of the guidelines

The main objective of the Guidelines for implementation of "Online collaboration methods and tools" is to present, in a comprehensible and practical way, the tools, contents and organisation of the training process of teachers, through which participants acquire the necessary knowledge, skills and competences essential for online collaboration and progress to a certification of skills.

The implementation process is derived from project partners' experience in the participating countries.

Short overview of the content

For this purpose, the document is structured as follows:

■ **ICT in education.** This chapter presents findings of educational surveys and gives a short overview of the main changes and trends of 21st century technological development and ICT use at schools. It also contains a description of main teacher training needs in terms of knowledge, skills and competencies, as revealed from the research conducted by the European Commission as well as a Training Needs Analysis conducted in the countries involved in project implementation.

■ **Training, testing and certification methodology.** This part contains the description of the training cycle that starts with target group selection and participants' knowledge and skills assessment, followed by training that utilises the developed learning materials and leads to certification of the acquired skills. The unit provides a guide on how to acquire the necessary knowledge, skills and competences essential for online collaboration. Moreover, this chapter explains the importance of teachers' skills certification and the ECDL module "Online Collaboration" test as well as the "Online Collaboration Tools in Education" test.

It includes also an overview of the created learning materials and their availability.

■ **Implementation experience of "Online Collaboration Methods and Tools" training and certification system.** This chapter presents the experience of four partner countries - Estonia, Germany, Latvia and Lithuania - of training programme implementation. Each country provides information related to areas including: participants' profile, preliminary skills assessment, training organisation, application of acquired knowledge to participants' independent work, themes used by participants for study projects, feedback on the training process, and certification test results.

■ **Conclusions and recommendations.** The final part suggests recommendations on further use of the developed material, and how the teacher training process should be organised to achieve the learning outcomes and meet the requirements of the certification test.

■ **Project partner profiles.** This section provides information about the project partner organisations that implemented the project.

ICT in education

Trends of 21st century technological development

Teachers working at schools today have to adequately equip students with skills to meet the challenges and demands of the 21st century: prepare students for jobs that we do not know yet, use technologies that have not been invented, develop skills necessary for the fast changing world.

It has been commonly recognized that ICT can help us learn better, more efficiently and creatively; promotes innovation and complex problem solving; gives access to wider and more up-to-date knowledge; and provides everyone with flexible and accessible learning opportunities, in and outside the classroom. Nevertheless, the European Commission has stated that the world of learning and teaching in Europe is still traditional.[5]

Reshaping education in Europe successfully can be done with the help of teachers who are confident in creating and sharing educational content; who can engage students in more personalization, collaboration; and who provide better links between formal and informal learning. To deal with this issue, the European Commission has adopted a high-level European Agenda - „Opening up Education"[6] - to seize the opportunities of the digital revolution in education and training, affirming that learning can't anymore be confined to specific classroom and timetables but must take full advantage of technology to break boundaries and learn across cultures, ages, and geographical divides.

Opening up education means taking advantage of the considerable benefits the digital revolution has to offer:

■   Increase effectiveness of education. Open Education Resources (OER)[7] and Massive Open Online Courses (MOOCs)[8] can

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[5] Opening Up Education; https://ec.europa.eu/digital-single-market/en/opening-education

[6] Opening up Education: Innovative teaching and learning for all through new Technologies and Open Educational Resources; http://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:52013DC0654&from=EN

[7] Open Educational Resources (OERs) are any type of educational materials that are in the public domain or introduced with an open

license. The nature of these open materials means that anyone can legally and freely copy, use, adapt and re-share them. OERs range from textbooks to curricula, syllabi, lecture notes, assignments, tests, projects, audio, video and animation. (UNESCO 2012), http://www.unevoc.unesco.org/go.php?q=Open%20Educational%20Resources

[8] MOOCs are courses designed for large numbers of participants that can be accessed by anyone anywhere as long as they have an

provide sharing practices and opportunities to innovate.

■ <u>Increase equity</u>. Knowledge becomes more accessible to all, and individuals get access to new learning opportunities, by lowering costs and better access to digital services.

■ <u>Produce positive impacts in the economy</u>. ICT use becomes more structured and leads to upskilling the workforce, helping industry manage change, through new market opportunities by fostering partnerships for infrastructures, new products and services.[9]

Open Educational Resources can ensure that educational materials produced with public funding are available to all and that learning can happen anytime, anywhere. Massive Open Online Courses allow students, practitioners and educational institutions to share free-to-use course material. The use of new technologies and OER can result in improvement of the efficiency, accessibility and equity of training and learning, which can become more focused on the learner, support individual learning pathways,

enchance collaboration online, and blend formal and informal education.

Future technology analysts and policymakers both agree that online collaboration should be considered as a priority area. The transfer from traditional offline application software towards the usage of online collaboration tools such as cloud data storage and web-based tools has started several years ago and together with online social interaction has become a defining tendency of 21st century technological development.

General trends of ICT use at schools

It has been reconized that education has not yet embedded the potential of new technologies, failing to provide European citizens with the skills necessary for the future.[10]

We are living a paradox: digital technologies are fully embedded in our economies and societies. They have, for example, changed the way people can access financial services, read the news or interact with each other, but technologies have not yet changed the way learning and teaching occurs in European training and education systems.

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internet connection, are open to everyone without entry qualifications, and offer a full/complete course experience online for free. http://www.openuped.eu/images/docs/Definition_Massive_Open_Online_Courses.pdf

[9] https://ec.europa.eu/digital-single-market/en/opening-education

[10] Analysis and mapping of innovative teaching and learning for all through new Technologies and Open Educational Resources in Europe Accompanying the document Communication 'Opening up Education', http://eur-lex.europa.eu/legal-content/EN/TXT/?qid=1389115521455&uri=CELEX:52013SC0341, p.3.

Integration of digital technologies and digital content in education and training systems does not simply mean more electronic devices or more broadband connections. Supporting learning with technologies allows for the combination of innovative pedagogies with an effective use of digital tools and content which in turn can boost the quality of teaching and learning processes.[11]

A recent study[12] on the state of digital provision in schools in the European Union revealed that 70% of teachers in the EU recognize the importance of training in digital-supported ways of teaching and learning, but only 20% - 25% of students are taught by digitally confident and supportive teachers. Most teachers use ICT mainly to prepare their teaching, rather than to work with students during lessons. Between 50% and 80% of students in the EU never use digital textbooks, exercise software, broadcasts/podcasts, simulations or learning games.[13] Only a few teachers use ICT - and still to a limited extent - to work with students during lessons, and even less frequently to communicate with parents or to adjust the balance of students' work between school and home in new ways. The overall frequency of use of different types of ICT-based activities in class reported by teachers is around several times a month on average at EU level.[14]

Teacher training needs

A study on indicators of ICT in primary and secondary education has shown that teachers often have difficulty in implementing ICT in the teaching and learning process and require support in this. It is not surprising that, across countries, teachers consider that they are more confident in their operational skills than in their use of social media[15].

[11] Analysis and mapping of innovative teaching and learning for all through new Technologies and Open Educational Resources in Europe Accompanying the document Communication 'Opening up Education', http://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX%3A52013SC0341, p.5.

[12] Survey of Schools: ICT in Education Benchmarking Access, Use and Attitudes toTechnology in Europe's Schools, http://ec.europa.eu/information_society/newsroom/cf/dae/document.cfm?doc_id=1800

[13] COMMUNICATION FROM THE COMMISSION TO THE EUROPEAN PARLIAMENT, THE COUNCIL, THE EUROPEAN ECONOMIC AND SOCIAL COMMITTEE AND THE COMMITTEE OF THE REGIONS Opening up Education: Innovative teaching and learning for all through new Technologies and Open Educational Resources, http://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX%3A52013DC0654, p 2.

[14] Survey of Schools: ICT in Education Benchmarking Access, Use and Attitudes to Technology in Europe's Schools FINAL REPORT, p.10; https://ec.europa.eu/digital-single-market/sites/digital-agenda/files/KK-31-13-401-EN-N.pdf

[15] Survey of Schools: ICT in Education Benchmarking Access, Use and Attitudes to Technology in Europe's Schools FINAL REPORT, p.101; https://ec.europa.eu/digital-single-market/sites/digital-agenda/files/KK-31-13-401-EN-N.pdf

Figure 1. *Teachers' confidence in their operational and social media skills*
(EU level, mean score of students)

Figure 2. *General education teachers' confidence in their social media skills*
(mean score by student, grade11, country and EU level, 2011-2012)

In the project partner countries there are rather different levels of use of online collaboration tools and social media in the education process. *Figure 2* provides data from European Schoolnet survey about general education teachers' confidence working with social media. Latvia and Lithuania are lagging behind the EU average.

The diagrams[16] reveal that the teachers' confidence in their social media skills (interaction and collaboration with each

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[16] Survey of Schools: ICT in Education Benchmarking Access, Use and Attitudes to Technology in Europe's Schools FINAL REPORT, p.103;

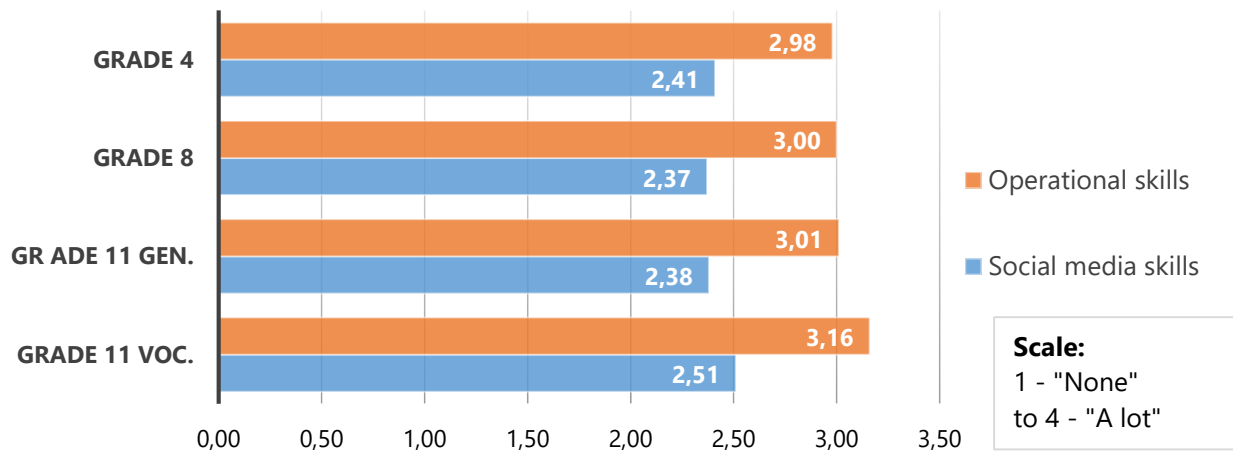https://ec.europa.eu/digital-singlemarket/sites/digital-agenda/files/KK-31-13-401-EN-N.pdf

other; the ability to participate in an online discussion forum; the ability to create and maintain blogs or websites; and the ability to participate in social networks) is not very high and is almost at the same level for the teachers of general education (*Figure 2*) and vocational education (*Figure 3*). The teachers of general education in Latvia have the lowest level of confidence in their ability to use social media skills among all EU countries.
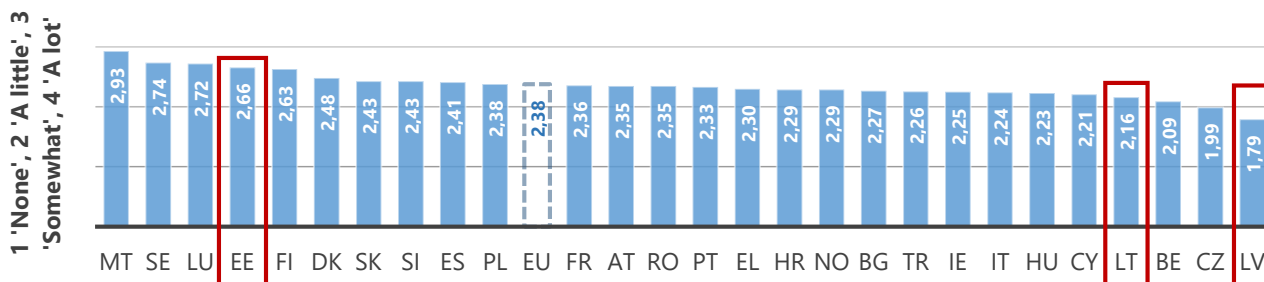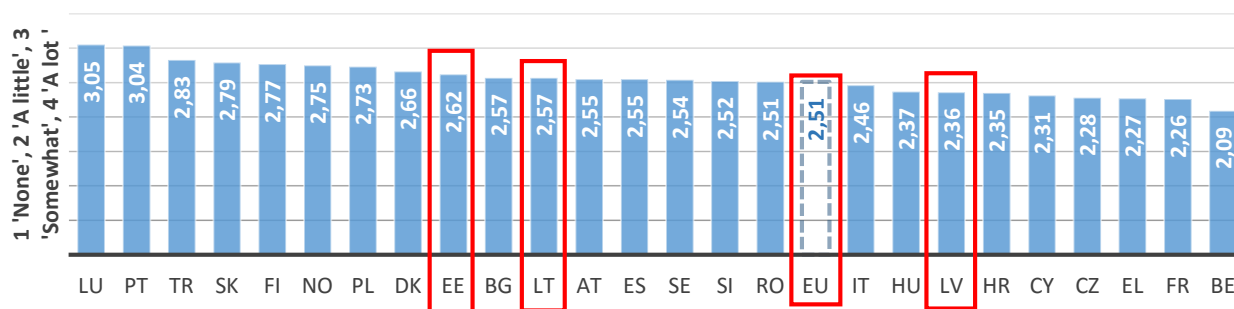

Figure 3. *Vocational education teachers' confidence in their social media skills (mean score by student, grade11, country and EU level, 2011-2012)*

The survey reveals that most frequently performed ICT-based activities at EU level relate to:

- preparation of teaching activities;
- creation of digital resources;
- use of the school website;
- use of a virtual learning environment.[17]

Conversely, teachers rarely:

- communicate online with parents;
- post homework for students on the school website;
- use ICT to assess students;

- evaluate digital resources, at all grades.

Between 60% and 85% of students are taught by teachers who declare they never or almost never participate in such activities. The first two of the more frequently reported activities suggest that use of ICT in schools does not yet support better home-school links, either in terms of communication or in terms of division of students' learning. Online collaboration is now a crucial element in the teaching process. Education needs to adapt to the potential of new technologies, such as online tools and social media. These technologies not only enrich existing learning

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[17] Survey of Schools: ICT in Education Benchmarking Access, Use and Attitudes to Technology in Europe's Schools FINAL REPORT,

https://ec.europa.eu/digital-single-market/sites/digital-agenda/files/KK-31-13-401-EN-N.pdf

practice, but they can open up the possibility to the educator of using different approaches to learning.

Moreover, we know that online professional collaboration between teachers can lead to effective changes in their practice, and a deeper awareness of their own professional development needs. Although centrally managed online resources such as blogs, forums or other social networking sites facilitating professional exchanges between teachers are widely available in Europe, they are a relatively new way for teachers to engage in professional development, and as the results of the European survey[18] show,

only a minority are actually using them and exploiting their benefits. There is a need therefore to further promote such online platforms and the opportunities they can afford to the European teaching community.

The survey reveals that the more teachers are confident in using ICT, the more they participate in professional development and spend time on such training, and the more they report frequent ICT-based activities during lessons across all grades.

In order to receive a more authentic view of the learning needs of teachers of project partner countries (Latvia, Estonia, Lithuania

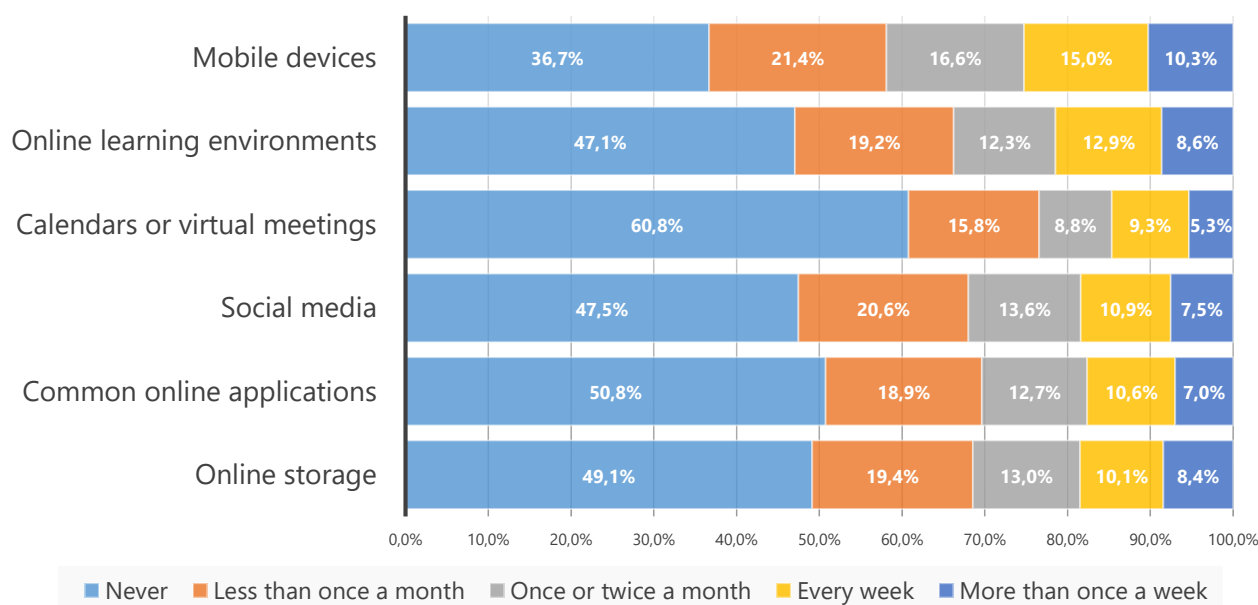|	Never	Less than once a month	Once or twice a month	Every week	More than once a week
Mobile devices	36,7%	21,4%	16,6%	15,0%	10,3%
Online learning environments	47,1%	19,2%	12,3%	12,9%	8,6%
Calendars or virtual meetings	60,8%	15,8%	8,8%	9,3%	5,3%
Social media	47,5%	20,6%	13,6%	10,9%	7,5%
Common online applications	50,8%	18,9%	12,7%	10,6%	7,0%
Online storage	49,1%	19,4%	13,0%	10,1%	8,4%

Figure 4. *Frequency of the usage of online tools in all project partner countries*

[18] Survey of Schools: ICT in Education Benchmarking Access, Use and Attitudes to Technology in Europe's Schools FINAL REPORT, p.90

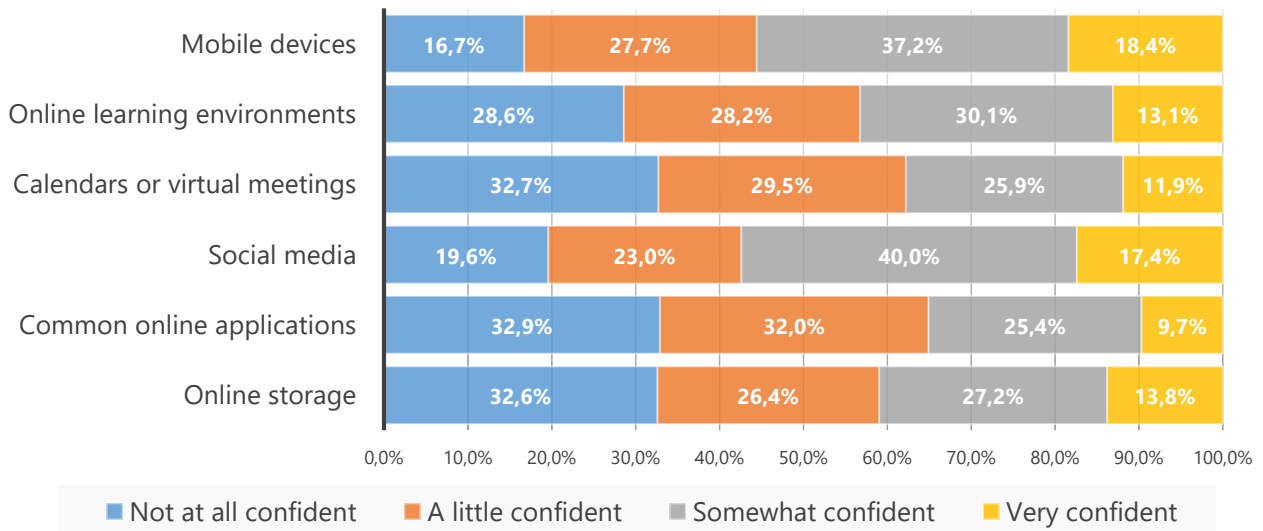|	Not at all confident	A little confident	Somewhat confident	Very confident
Mobile devices	16,7%	27,7%	37,2%	18,4%
Online learning environments	28,6%	28,2%	30,1%	13,1%
Calendars or virtual meetings	32,7%	29,5%	25,9%	11,9%
Social media	19,6%	23,0%	40,0%	17,4%
Common online applications	32,9%	32,0%	25,4%	9,7%
Online storage	32,6%	26,4%	27,2%	13,8%

Figure 5. *Teachers' confidence using online collaborative tools in all project partner countries*

and Germany), national surveys were conducted with the aim to analyse the gaps of knowledge and skills revealed in the field of online collaboration.

The tools listed in the survey were those that were identified as being frequently used online collaboration tools, as specified in the ECDL / ICDL Online Collaboration module[19]:

- Mobile devices;
- Online learning environments;
- Calendar or virtual meetings;
- Social media;
- Common online applications;
- Online storage.

The survey[20] focused on teachers' experience with the use of online tools and the survey results revealed the fact that although respondents indicated the relative importance of online tools, especially mobile devices, online learning platforms and online storage, these tools were only used infrequently or never by a large proportion of respondents. Even the most common used tools - mobile devices - were used never or less than once a month by almost 60% of teachers. There is also a significant number of respondents who do not or only rarely use common tools (approximately 50%) and who are not or only a little confident (approximately 70%) in using these tools. This indicates that there is considerable potential for teachers to develop their awareness,

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[19] http://www.ecdl.org/programmes/index.jsp?p=2928&n=2948

[20] Project "Online4EDU". Results - Beneficiaries' Skills Gap and Training Needs Analysis

knowledge, and skills relating to how these commonly-used tools can be used in an effective and controlled way in an educational environment.

Respondents indicated their confidence in using a range of online collaborative tools. Confidence varied between tools, but even for ubiquitous tools such as mobile devices and social media, on average more than 40% of respondents were not at all confident or only a little confident. This level of confidence indicates that there is a very substantial cohort of teachers who lack the confidence to use even common online tools in the classroom. The impact of this lack of confidence may be exacerbated if teachers feel that their students are potentially more proficient in the use of these tools than they are.

This suggests that a programme that is focused on the needs of the majority of teachers who are at the start of the process of learning to integrate online collaboration tools into their teaching practice is very needed. The survey findings prove that the programme should introduce and build on introductory topics in this area to support these participants. Despite a range of initiatives in the general area of ICT in all countries, there is a gap in skills and confidence relating to the use of online collaborative tools.

Online collaboration currently is very important in the teaching process. Education needs to accommodate a new learning model using big data and including smart devices. The old learning approach based on desktop computers is not enough attractive and effective for the students. Currently teacher should be innovative, giving students an opportunity to create, collaborate, share and publish. There are various online collaboration tools and platforms (charged and for free) created for teachers in all the world as well as various courses for educators about ICT usage in their lectures. The findings of the international and national surveys prove that teachers need training that is focused specially on their role in the education system and the situations they face as teachers not just as ICT users, including online collaboration skills.

Training, testing and certification methodology

The general description of the training circle

The objective of the project "Online4EDU" is to facilitate the development of teachers' ICT skills, particularly applying online collaboration tools in everyday school life. To reach this aim the project team designed, developed and piloted a training and certification system for teachers and e-Facilitators that includes the complete set of learning and testing tools:

- Curricula;
- Online learning environment;
- Courseware - E-learning materials and an e-course;
- Self-assessment test - Online Barometer;
- Online certification module "Online collaboration methods and tools in Education";
- Guidelines for implementing the system for teachers.

The main goal of the developed training cycle is to organize the learning process as a complete circle that begins with the selection of the target group and participants' preliminary knowledge and skills assessment.

This stage is followed by training process, when the participants are involved in various learning activities using a variety of training methods and forms. During training, the participants practically use and acquire experience of diverse online collaboration tools - including those on the Moodle platform and others. To successfully participate in training, the participants' ability to plan own time and activities, as well as collaborate with other team members and trainers, is essential.

Training should lead to successful certification in the "Online Collaboration Tools in Education" test and the ECDL Online Collaboration test, and Education projects development by the participants.

At the end of the training cycle, teachers have gained new knowledge and skills to be used in the everyday teaching process working with students, and they have also gained the confidence and desire to develop and perfect their use of ICT in the classroom.

The target group

There are 2 levels of beneficiaries that will be impacted by the training: the primary target group and secondary target groups.

The primary target group includes:

- Teachers in primary and secondary schools;
- VET specialists;
- E-facilitators working at telecentres, libraries, adult education centres, etc.

This target group will benefit from participation in training and certification, which will improve their knowledge and competencies in the labour market.

Although the training material has been aimed for teachers of all subjects, ICT teachers can benefit from participation in the training process.

The second target group is organizations responsible for teachers' skills upgrade and their professional development, mostly different players in the education system: decision makers at schools, adult education centres, state education agencies and offices, and Ministries of Education. They will be able to access and use the developed resources. It is planned to gain formal recognition of the training program as a professional development program.

Another target group who will benefit from teacher training is students - both in the formal education system and in adult education centres.

The target group selection principles

Although formal criteria (mentioned above) for the selection of participants are important,

it is essential to consider their previous knowledge and experience, as well as their willingness to engage in the training.

The following aspects should be taken into account when inviting participants to join the training program:

- Participant's ICT skills.

In order to successfully participate in the training process the participants need at least basic ICT skills and media literacy competences including knowledge of creating, sending and receiving emails. It is mandatory for participants to have an own email account. Prior knowledge about online collaboration tools is not obligatory. The course introduces online collaboration tools from a basic level and accompanies the participants in achieving more detailed knowledge about online collaboration tools.

- Communication skills.

As the training process includes group work and project development, participant's ability to present and explain ideas effectively and to listen is very essential.

- Interest in online collaboration tools.

Participants must be willing to acquire and later on work with recommended tools and applications such as Skype and Google.

■   Self-discipline.

Taking into consideration that the training process is based on a blended learning concept where participants are required to work independently using online training materials and carrying out various tasks, it is crucial to have the tasks done in time to successfully acquire all the material and proceed to the certification of the acquired skills. An important part of the course involves the day-to-day work of teachers such as preparation of lessons and teaching with online collaboration tools. The course offers examples for application, and the teachers are required to implement the acquired knowledge and skills into their everyday teaching practice.

Pre-training knowledge and skills assessment

In order to obtain general information about the target group members in the beginning of the training process, the participants are recommended to complete a Pre-Course Questionnaire consisting of several sections.

In the **questionnaire** the participants provide information including:

■   Personal and professional details (information about the participant's gender, age, teaching experience, the grades of students they typically teach, subject area- main subjects taught);

■   Current pattern of use of online collaboration tools (information on how often and what online collaboration tools teachers use in their daily work);

■   Confidence in using online tools (teachers evaluate their own confidence in using a range of online tools in teaching);

■   Skills development experience (information on whether a teacher has attended courses / training in ICT over the last three years, or if they have ever been engaged in any formal or informal activities that have helped develop skills relating to the use of online tools (e.g. referencing online resources, Guidance from peers).

After completing the Pre-Course Questionnaire teachers are asked to fill in the online pre-testing tool (Barometer).

Online Collaboration skills pre-testing tool - Barometer

Online Collaboration skills barometer developed in the project is meant to be used as a tool to help people test their online collaboration skills and evaluate their knowledge about online collaboration and receive direct results and recommendations for improvement.

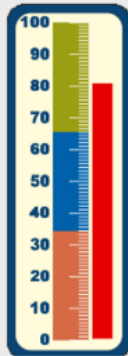The advantages of such evaluation tool are:

• Easy access - as it is an online self-assessment tool it can be used any time, any place with Internet connection;
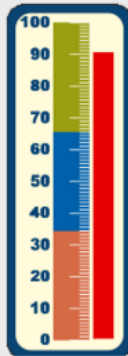
Online Collaboration skills barometer

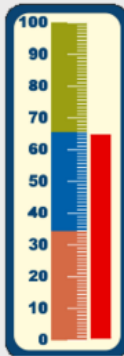**Erasmus+ ONLINE4EDU**

Online4edu diagnostic barometer

Barometer results

General Knowledge: 80%

Webinars, Online seminars: 90%

Mobile collaboration tools: 64%

Section 1 - General Knowledge about Online Collaboration Tools

You appear to have **an upper** level of knowledge about online collaboration tools. Congratulations; you appear to be an expert in using online collaboration tools. We would like to encourage you to share your knowledge with your colleagues and acquaintances to help them in their performance of everyday tasks and to facilitate your collaboration.

Section 2 - Webinars, Online seminars

You appear to have **an upper** level of knowledge about webinars. Congratulations; you appear to be an expert in webinars. We would like to encourage you to involve others in webinars and to share your knowledge about webinars with your colleagues and acquaintances for inspiring them to use webinars and making their communication more comfortable.

Section 3 - Online collaboration tools on Mobile devices

You appear to have **an intermediate** level of knowledge in using mobile devices for online collaboration. You have developed a good notion about usage of mobile devices for online collaboration. We would like to encourage you to supplement your knowledge and experience of using mobile devices in online collaboration.

- Time saving - it takes around 20 - 30 minutes to answer 31 question of the self-assessment;
- Speed - immediate test results displayed on the screen and sent to you by e-mail.

Barometer is available in 5 languages - Latvian, English, German, Lithuanian and Estonian.

The Barometer questions focus on **3 areas**:

- General knowledge about online Collaboration tools;
- Webinars;
- Mobile Collaboration tools.

The online pre-testing tool (Online Collaboration Barometer) should be used before starting the training course in order to assess the participants' basic internet essentials, online communication and collaboration skills. This tool allows identifying the participants' competence of online collaboration tools management and receiving an automated evaluation with references to necessary improvements.

When the received responses have been analysed, the teacher considering the participants' training level plans further steps to help any student to successfully participate in the training process.

The advantages of pre-test tool should be used to assess the initial knowledge level as well as to provide a training and certification roadmap and advice on upgrading skills.

Training methodology and organisation

The teachers' training process is organised using a blended learning concept, combining online and face-to-face learning methods. This means that the knowledge and skills acquisition process is based on both face-to-face training and online training (workshops moderated by trainer, students' independent work using online training materials, and collaborative group tasks. It is important that students at any time during the online training phase have an opportunity to receive trainer's support - ask questions they are interested in, ask for help if there is confusion or failure to perform a task, and receive feedback, work assessment, and recommendations from the trainers.

This timeline shows the chronological structure of the blended learning course. The three colours represent different types of curricula.

Independent online learning supported by a trainer / E-tutoring

Face-to-face training

Online workshop moderated by trainer
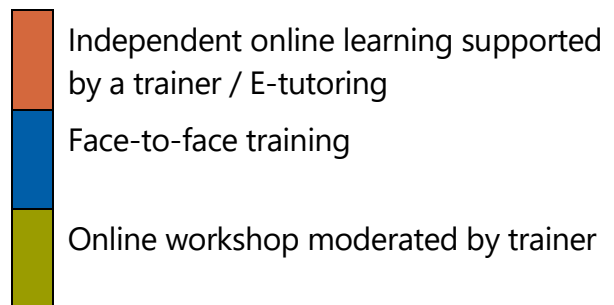
E-Learning orientation phase

When the participants have been selected, they have one week to become familiar with the e-learning environment and conduct self-assessment tests in order to evaluate their level of knowledge and their learning type. This is followed by introductory face-to-face meeting.

Introduction face-to-face workshop

The face-to-face training in the beginning of the course establishes trust and motivation by allowing the participants to get to know each other and introducing the trainer and the topic. During the face-to-face training participants are welcome to state difficulties
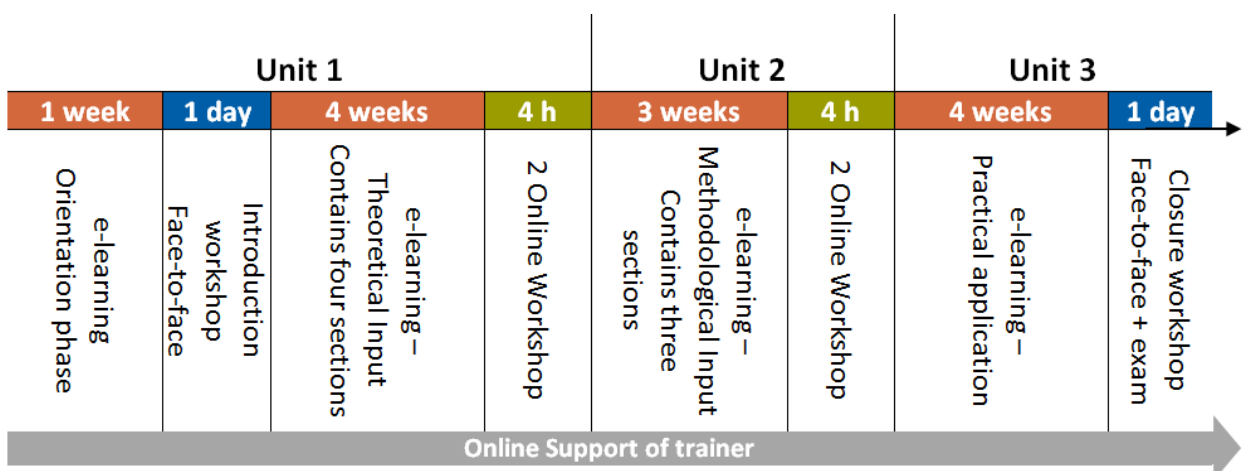
with the e-learning environment so that all problems are clarified when the online training starts. The face-to-face training also offers the chance to identify with the project and organise the participants into groups on the basis of previously identified knowledge levels (Barometer).

Online training/E-learning

The online training starts after a short orientation phase and lasts for more than three months. In this time the participants learn about online collaboration tools by using them as e-learning tools like Moodle and Google Calendar. In this phase participants do assignments both in individual work and in their groups. The latter intensifies the work with online collaboration tools.

The teachers who successfully finish the training receive a confirmation about the training course's completion. To obtain this confirmation teachers have to complete:

- pre-training evaluation (Barometer);
- 8 tasks in Unit 1;
- 6 tasks in Unit 2;
- final project presentation in Unit 3;
- 7 self-assessments (the result must be above 75%).

If the previously mentioned conditions are completed, teachers are allowed to take the ECDL test.

During the on-line training process the trainers assessed the participants' achievements by awarding badges.

There are **3 types of badges** a trainer can assign to a teacher for the following achievements:

A teacher is rewarded with a **blue badge** if he/she has completed 5-question questionnaire in the end of every section. Blue badge is assigned if 75% of answers are correct.

A teacher can get a **green badge** if he/she has submitted 1 individual and 1 group assignment.

A teacher is rewarded with a **red badge** for extra effort if he/she has done more assignments than two or he/she is very active and supportive in forums. The red badge is given also for leading teamwork during the week, if all group assignments are completed.

Quality standards for assessment of submitted tasks/results depend on type of each task:

■ Creative tasks - as these are tasks where teachers provide their opinion and could not be objectively evaluated. The criterion is that a teacher's answer should be well-grounded and explicit;

■ Practical usage of tools - the teacher has to add a link to the result or a screenshot of the activity with evidence that he/she is the author of the result. It is also possible that a solution or a result of the task is given as a description of teacher's experience performing the specific task;

■ Teamwork - as it is teamwork, each teacher's contribution to it should be seen or described.

Online workshops

It is recommended to organise four online workshops during the online learning phase, two in the first unit and two in the second unit. The workshops cover three critical aspects of online learning. Firstly, the workshops are meeting points on the path of learning "alone" in front of the computer and offer exchange and new motivation. Secondly, participants and trainers get the opportunity to share experience and problems with content of the course as well as organisational or technical difficulties. And thirdly, the online workshop offers a third learning method giving the opportunity to teach with audio and video communication.

Group work

The grouping of the participants is an essential method of the course. In the first face-to-face meeting the participants are divided into groups of four to five participants in which they will stay during the whole course. The groups facilitate the learning process in various ways: firstly, the participants have to communicate and collaborate within their groups by using the promoted online tools in order to pass the weekly group assignments. By immediately applying the tools the participants lose their insecurities, face and solve problems together and realize the benefits of the tools directly. Secondly, being in a group enhances the motivation of each participant. Everyone has not only to answer to the trainers but as well to their fellow group members. Thirdly, the participants start with different levels of skills and knowledge. During the group work participants support each other, solve problems together and therefore enrich the learning process. Fourthly, the groups foster exchange of good practices and strategies beyond the course via online collaboration tools. The grouping of the participants can be made according to the Barometer results. Then each group should contain participants with low, medium and high results in order to ensure mutual support. The groups can be formed according to the type of school or interests of the participants in order to guarantee vivid exchange even beyond the course.

Final face-to-face workshop

The final face-to-face training provides opportunity to three relevant aspects of the course: firstly, the results of the project work in unit 3 are presented (mandatory to pass the course) by the groups and evaluated by the trainers. Secondly, the participants can express their opinions about the course. Thirdly, the certification tests should be discussed and remaining issues clarified.

The learning materials

The curricula and courseware includes such chapters as: Key concepts for online collaboration, Cloud computing, common setup standards for online collaboration, online storage and productivity applications, Online calendars, Social media, Online meetings, Online learning environments, Mobile collaboration applications and synchronization.

The curriculum and the corresponding training materials are designed with the objective that at the end of training teachers know:

- Concepts of online collaboration, benefits and risks;
- How to set up online collaboration tools and what settings must be considered;
- Common online collaboration tools and their usage;
- How to use online collaboration tools on mobile devices;

- How to prepare school lessons with online collaboration tools;
- How to teach with online collaboration tools;
- Ways to teach about online collaboration tools (optional).

By achieving these learning aims participants will be prepared for the ECDL Online Collaboration Tools in Education certification test.

The content

The blended learning course is organised in three units that are each based on different methodological concepts according to the content that is facilitated.

■ **Unit 1** is meant to raise participants' awareness about the use, benefits and risks of online collaboration tools, introduce technical aspects.

■ **Unit 2** is intended for the acquisition of practical use of online collaboration tools in teachers' daily work and learning process.

■ **Unit 3** requires the participants to apply the acquired knowledge and demonstrate the newly acquired skills while developing own projects with online collaboration tools. Each unit consists of sections; sections consist of topics and if needed topics can be divided into subtopics where relevant.

At the end of every topic there is an individual and a group assignment. In each week of the course there are six to eleven topics and therefore assignments. Participants are obliged to submit one individual assignment and one group assignment each week.

Unit 1

In unit 1 the participants learn the technical aspects of online collaboration tools. Therefore, this unit emphasises on a chronological structure that meets the participants on a basic level and provides knowledge on all competences that are important for both participation in unit 2 and especially for the ECDL Online Collaboration and the Online Collaboration Tools in Education tests. Unit 1 is framed by a face-to-face training in the beginning and an online presence workshop at the end of the online learning sections. Some of the content of Unit 1 can be already discussed in the face-to-face training, others in the online workshops. The blended learning concept offers the opportunity to present and apply various tools already in unit 1 so that the participants learn about online collaboration tools by using them. For instance, the essential learning environment is the e-learning platform which is part of the content in unit 1.

Requirements for supervision: Unit 1 is demanding in regard to the content and at the same time farthermost away from the daily work of teachers. Therefore, it is essential that trainers strongly support and motivate participants. Furthermore,

participants in unit 1 learn to work with online collaboration tools that can be best learned in groups. The trainer has, therefore, to promote group work and coordinate it, if necessary. It is essential for the whole course that the participants identify both with the learning objectives of the course and with their respective groups in order to stay motivated and stay in the course until the end.

Passing criteria for unit 1: All four weeks are mandatory and have to be finished before starting unit 2 (exceptions can be made by the trainer if necessary). Each week offers several tasks concerning respectively one learning aim. In order to finish and pass a week the participants have to choose and process one task individually, and choose and process one task in group work. The two tasks should not be the same.

Time investment: Unit 1 is designed for four weeks in total. The estimated time investment for participants per week is two to three hours for advanced participants. Participants who are not experienced working with digital media will need six to eight hours per week; the estimated time investment for trainers is two hours per day.

Unit 2

Unit 2 provides not technical but methodological learning content. Here the acquired technological knowledge about online collaboration tools is complemented by pedagogical ways of applying them in

three different directions: firstly, participants learn how to use online collaboration tools for the preparation of their work and how to collaborate with colleagues; secondly, the focus is put on collaboration with students and teaching with online collaboration tools; thirdly, participants learn to teach their students about online collaboration tools. Week 1 and week 2 are mandatory for all. Week 3 is additional for participants who are interested in learning how to teach about online collaboration tools and can implement the competences in their lessons. The unit is complemented by two online presence workshops which provide space for the participants to clarify open issues and sum up the online course before starting with the project work.

Requirements for supervision: It is again especially important to give a feeling of shared identity and togetherness to the participants so they will not get the feeling they learn "alone" in front of the computer. Communication and exchange will be very important and must be promoted by the trainers.

Passing criteria for unit 2: Week 1 and week 2 are mandatory and have to be completed before starting unit 3 (exceptions can be made by the trainer if necessary). Week 3 is additional. Each week offers several assignments concerning respectively one learning aim. In order to finish and pass a week the participants have to choose and process one assignment individually, and choose and process one assignment in group work. The two assignments should not be the same.

Time investment: unit 2 is designed for three weeks in total. The estimated time investment for participants per week might be less than in unit 1 because the content is closer to the teachers' occupational routine. We still estimate two to three hours for advanced participants and six to eight for participants with a lower level of digital literacy; the estimated time investment for trainers is two hours per day.

Unit 3

Unit 3 stands out as praxis unit in which the participants have to apply their acquired knowledge in group work while no more content is facilitated. The participants will work together in groups on specific projects in which they use their knowledge and skills to develop their own project with online collaboration tools.

Requirements for supervision: In this unit the participants work autonomously in their groups. The trainer must be present for questions and answer within 24 hours. Trainers must offer support continuously via email and forum. He / she will have a first impression of developed concepts when participants upload the results before the closure training.

Passing criteria for unit 3: In order to pass the project work, participants have to upload their project concepts (e.g. documents, video, PPT-presentation, podcast) in order to prepare for the presentation at the closure workshop.

Time investment: unit 3 is designed for four weeks in total in which the participants have to organise their own time. The estimated time investment for participants per week is two to three hours; the estimated time investment for trainers is two hours per day.

The availability

The developed e-course is available in four languages: German, Latvian, Estonian and

It is hosted on a Moodle platform
http://moodle.bcskoolitus.ee/

Moodle is a type of open source software package under the GNU general public license for conducting online learning course management through a virtual learning environment. It has become very popular among educators around the globe. Many institutions use Moodle to conduct online courses or blended learning. It can run on any machine that runs PHP and support SQL database types. It allows educators to manage and promote learning. Moodle gives many features to educators as discussion forums, Moodle instant messages, online news and announcements, grading, files downloads, online calendars, online quizzes and Wiki.

Lithuanian.

Certification of skills

The role of certification

Certification provides objective verification of an individuals' skills and demonstrates their competency to a recognised standard.

Specifically, certification offers the following benefits**:**

- It defines the set of skills that people need to be effective in their roles;
- It provides a means to assess workforce skills and build a training plan;
- It proves that individuals have the skills to carry out their work competently;
- It increases overall efficiency and productivity;
- It offers a clear measure of the return on investment in training;
- It works as a motivator for people to complete the training.

In the context of the Online4EDU project, certification acts both as a focus for participants' work as they progress through the programme, and incentivises completion. Candidates know that not only will they have taken part in an effective training programme, but they will have an independent validation of their abilities if they meet the required standard.

One the main certification components in the project is the ECDL Online Collaboration module. This is certification module that has been developed by ECDL Foundation, a not-for-profit organisation focused on providing certification programmes that assist individuals to develop digital skills. ECDL Foundation has engaged with more than 14 million individuals in 150 countries.

The ECDL Online Collaboration and the Online Collaboration Tools in Education tests

At the end of training the teachers took two tests: the ECDL "Online Collaboration" test and the "Online Collaboration Tools in Education" test.

ECDL Online Collaboration test

The ECDL Online Collaboration module consists of a syllabus and certification tests developed by ECDL Foundation. This module sets out concepts and skills relating to the setup and use of online collaborative tools, such as storage, productivity applications, calendars, social media, web meetings, learning environments, and mobile technology.

The tests have been adapted to an online testing environment by Lithuanian partner ITI and localized into Lithuanian by ITI, Latvian by LIKTA, Estonian by BCS Koolitus and German by Stiftung Digitale Chansen. According the ECDL Foundation requirements Online Collaboration test' questions should correspond to the question test base provided by ECDL Foundation and should consist of at least 4 sets of questions. Every

set should have 36 questions. Therefore at least 144 questions should be prepared.

There are two types of questions in question base:

- multiple choice questions, where only one of the four answers is correct;
- hotspot questions (questions with an interactive image), where the correct answer has to be marked in the picture.

Online collaboration test questions are presented in plain language and are easy to understand for candidates from various backgrounds. The output of test reflects the stated skill or knowledge-based goals of the ECDL Online Collaboration Syllabus.

A formal expression of this characterization is summarized as follows:

- The test experience is unthreatening for the test taker.
- The test taker has ample time to complete the test.
- The test should be accessible to all.
- There are no trick questions.
- The certification test has a high pass mark consistent with a competency-based test.

Test and question items are designed with this characterization in mind and are evaluated in the context of these criteria.

One test consists of 36 questions that have to be taken in 45 minutes. The pass rate is 75%.

The tests are loaded and delivered through an automated test engine.

Online Collaboration Tools in Education test

Online Collaboration Tools in Education tests were developed during the project according to Online4EDU Syllabus V1.0. This module sets out how online collaboration tools can influence teachers' work, using of online collaboration tools in teaching process and using online collaboration tools in practice. The test base contains 64 questions (48 multi answer questions with single correct answers and 16 hotspot questions).

Online collaboration test questions were created according to Online4EDU Syllabus 1.0, consisting of three parts: "Create learning material", "Integration in daily lessons and collaboration with students", and "Usage of online collaborative tools in practice".

In order to mirror ECDL Foundation requirements for its certification test, Online Collaboration Tools in Education test questions correspond to Syllabus and are grouped in 4 sets of questions. Every set should have 14 questions. Therefore at least 56 questions are prepared.

There are two types of questions in question base:

- multiple choice questions, where only one of the four answers is correct (48 questions),
- hotspot questions (questions with an interactive image), where the correct answer has to be marked in the picture (16 questions).

One test consists of 14 questions that have to be taken in 20 minutes. The pass rate is 75%. The tests are loaded and delivered through an automated test engine.

Implementation of "Online Collaboration methods and Tools" training and certification system

Estonia

Participants' information and selection process

Information about the project and invitation to participate in pilot training was sent by e-mail to all Estonian schools. Each school could nominate one teacher to participate in the training. When schools had proposed their candidate, they were sent an online registration form.

Before the pilot training teachers filled in a pre-training questionnaire and evaluated their confidence in using online collaboration tools. The teachers were divided into 2 groups based on their experience using online collaboration tools.

How confident are you in using online collaboration tools in teaching?

- A little confident — 53%
- Somewhat confident — 28%
- Very confident — 19%
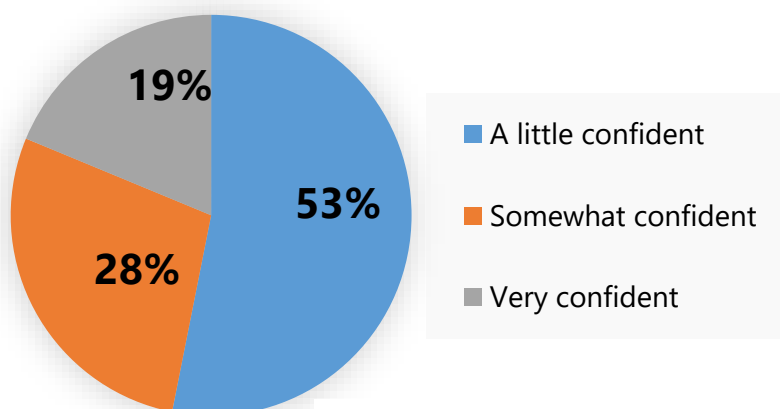
Figure 6. *Teachers' confidence in using online collaboration tools in Estonia*

■ Group 1 - teachers who did not use online collaboration tools in their work because they did not feel confident using them.

■ Group 2 - teachers who had some experience using online collaboration tools. Although these teachers had some experience they still did not feel overly confident when using online collaboration tools in their work, so they needed to learn new skills and raise their confidence.

Participants' profile

The total number of participants who participated in training was 30: 26 (87%) were female and 4 (13%) were male. Out of those who began their studies, 14 (47%) were in the age range 36-45, 8 participants in the age range 46-55 (27%). Most of the teachers had rich teaching experience: 44% of the teachers had 11-20 years of practice, 44% had more than 20 years of practice and 11% of teachers had 6 -10 years of practice.

The survey showed that many participants taught more than one subject. Subjects taught were foreign languages, literature, natural sciences, ICT/technology and reading, writing and literature. Teachers whose subject taught was IT were admitted to the project because they needed the latest knowledge

Division based on the subjects

Figure 7. *Division of teachers in Estonia based on the subjects they teach*

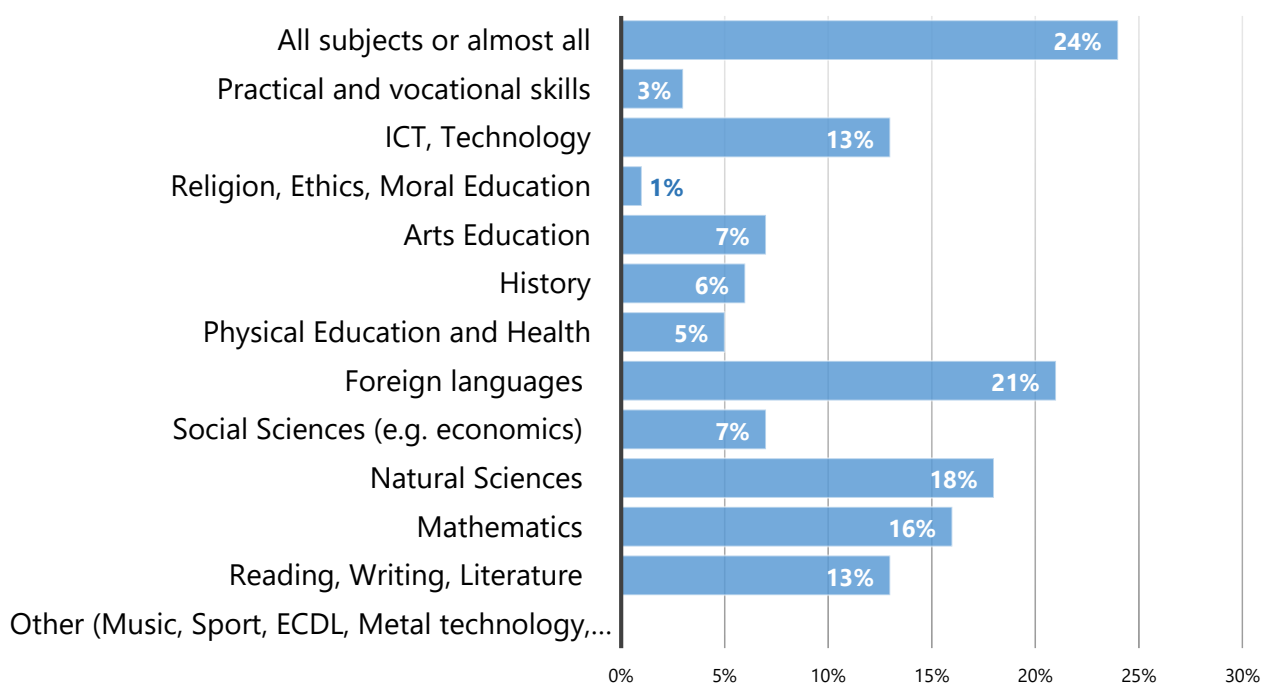on online collaboration tools. A substantial portion of participants (24%) indicated that they taught almost all subjects; there were also many teachers who taught foreign languages (21%), natural sciences (18%), as well as mathematics.

Teachers' motivation to join training and previous experience in the training area

The survey showed that the main motivation for participants to join the pilot was the need to use Online Collaboration methods and tools in their work. The teachers were interested in such issues as integration of smartphones into education, new environments where to create educational materials and how to share them, simple techniques/ methodologies for the use of digital resources, etc.

Some of the teachers stated that they had already acquired a little knowledge on online collaboration tools, like Google drive and One Drive learning by themselves.

Before starting, the pilot teachers evaluated how often they used online collaboration tools in their teaching practice.

The survey shows that the situation is quite varied - there are teachers who never use online collaboration tools, teachers who use them once a month or once a week and teachers who use them every day. 56 % of the participants stated that they use online collaboration tools in teaching practice quite regularly (every day or more than once a week).

How often do you use online collaboration tools in your teaching practice?

Legend:
- Every day
- More than once a week
- Never
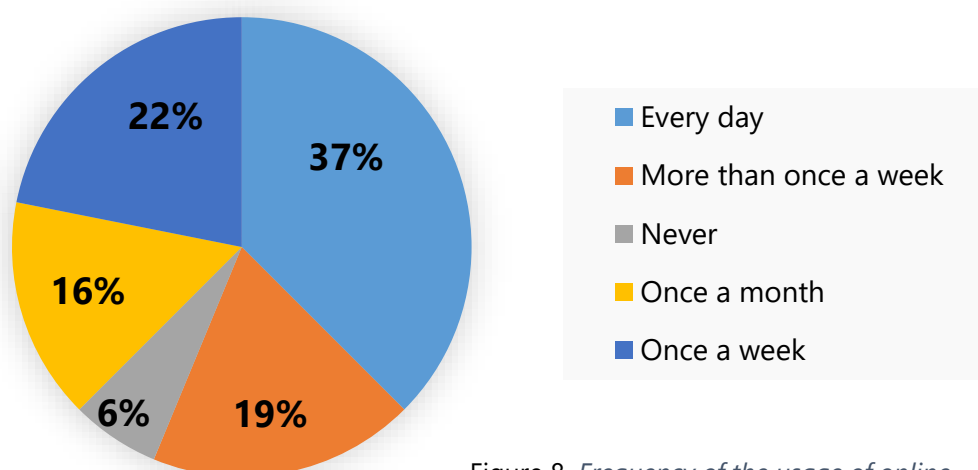- Once a month
- Once a week

Figure 8. *Frequency of the usage of online collaboration tools in teaching practice in Estonia*

Participants' pre-training skills assessment

Overall results according to the Barometer test were good. The lowest score was 68% and highest score was 97%. For half of the participants the skills were assessed as medium, 10 teachers or 33% got the score around 85% - 90%.

Results of Barometer test
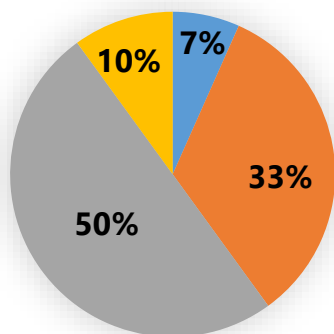
- Very Good (more than 90%)
- Good (85%-90%)
- Medium (70%-84%)
- Basis (Below 70%)

Figure 9. *The results of participants' pre-training skills assessment in Estonia*

In the general knowledge part, the lowest score was 50%, 14 participants received the test result of 90% and 14 participants got the highest score (100%).

First face-to-face meeting, trainers introducing the Moodle

Webinars test results were also good. The lowest score was 60% and highest score was 100%. 19 participants received test results around 80% - 90%.

In mobile collaboration the lowest score was 55% and the highest score 100% was received by 4 participants.

Training process organization

In Estonia two groups began their studies with one week interval. The groups had an orientation phase lasting one week and it was followed by the first face to face meeting. Before the orientation phase each teacher got an e-mail with information how to enter the Moodle and about the first tasks.

The first face to face meeting started with introducing each other and trainers. Then the structure of the course and Moodle was explained. Criteria to pass the course were discussed, teachers divided into groups and group leaders were chosen for each week.

During the course trainers were supporting and motivating teachers by sending and answering questions by e-mail, having Skype

meetings and communicating with teachers in Moodle Forum.

During the second face to face meeting, groups presented their group works, took an ECDL Online Collaboration test and the additional test and discussed the advantages and disadvantages of the pilot course.

Participants' opinion on the content

Participants found that all topics were useful and interesting. Teachers liked that every week they had new tasks and they could be done individually and in groups. They also appreciated the opportunity to discuss issues in Moodle forum.

Participants' practical work implementation examples

In Estonia, the Online4EDU project was successfully finished by 28 teachers.

In the last meeting participants presented their group work. They had to prepare an online presentation about different possibilities of how to improve the use of online collaboration tools in their school and then introduce them in their work place. They also had to describe five different problems in their schools and find solutions for them.

For example, teachers introduced web meetings (Skype) into their school life as the school was located in several buildings. The planning of the equipment used was managed using Google Docs. Other groups used an online "virtual wall" Padlet to gather information and prepare for school event. One group came up with a JENGA game, teaching maths and using the QR code.

First face-to-face meeting, team work

Results of ECDL certification

In Estonia, the ECDL test was taken by 28 teachers. 89% of the participants successfully passed the first ECDL Online Collaboration test, but the second Online Collaboration Additional test was passed by 96% of the participants.

One participant: "After the training, I dare to experiment and try out more. Participation in the training gave me a lot of confidence. Thank you! "

How can the program complement the education system of the country?

One of the main goals is to get a quality label for the course and get recognized by HITSA (Information Technology Foundation for Education). HITSA is a partner to the Estonian Ministry of Education and Research, educational institutions and Estonia's ICT sector in providing competitive ICT education. The HITSA Innovation Centre offers in-service training which is designed to foster the digital skills of teachers, lecturers, education technologists, directors of educational institutions and other education specialists.

Teachers taking the ECDL tests

Kristi Vahenurm,

The trainee of Online4EDU pilot course:

"All in all, it was good to witness that the learners who gathered for the final contact class and the tests said good things about the course, found it useful and were happy about having new contacts across the country".

Final face-to face meeting, the second group

Germany

Participants' information and selection process

As Germany is a relatively big country consisting of sixteen federal states that have different regulations, relating for example to further education of teachers, holidays, and curricula, it was decided to offer the pilot of Online4EDU course in Berlin-Brandenburg and Hesse federal states. Berlin-Brandenburg was chosen because the Digital Opportunities Foundation is located in Berlin, which is a city state within Brandenburg. Furthermore Brandenburg introduced a new curriculum including the use of digital media in schools lessons. Hesse was chosen because in this federal state teachers are formally obliged to attend accredited further education courses, and it was possible to get accreditation for the Online4EDU course.

To inform teachers about the course and to achieve a wide spread coverage, an online newsletter was sent to 250 schools (primary and secondary schools as well as vocational schools), and regional school authorities.

Additionally 150 schools and regional authorities were addressed by sending out flyers via post.

Teachers could register online through Online4EDU project website. 37 teachers registered for Potsdam and 12 teachers for Rodgau. 25 participants were included into the pilot group in Potsdam. The selection was made according to who registered first and if possible only one teacher from one school was accepted.

Participants' profile

Number of male and female participants was almost equal; out of 37 participants 21 or 57% were women, while 16 or 43% were men. If we look at the breakdown by age, then the largest group (16 participants or 43%)

Division based on the subjects

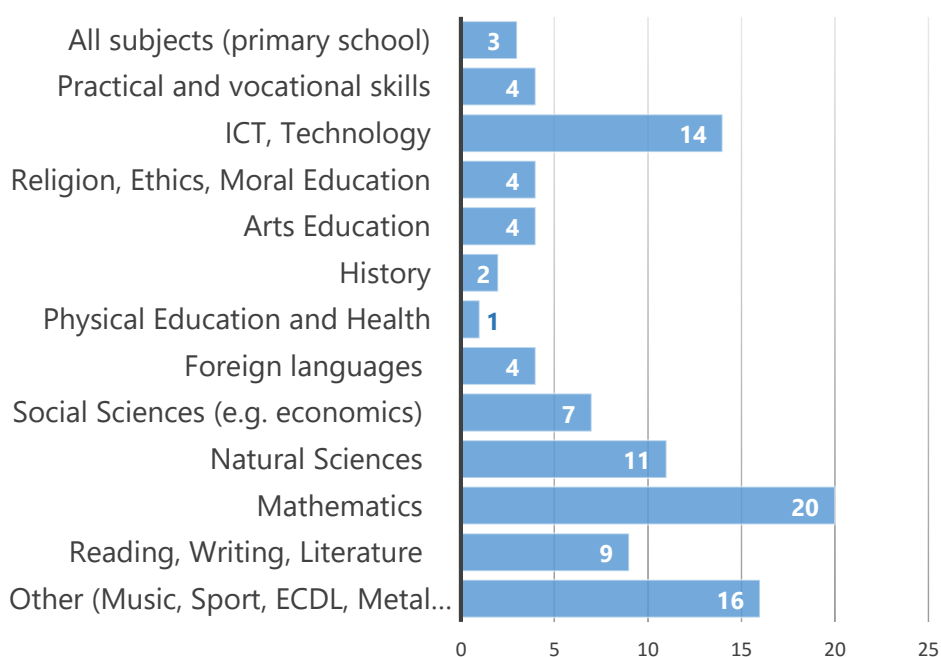| Subject	Count
All subjects (primary school)	3
Practical and vocational skills	4
ICT, Technology	14
Religion, Ethics, Moral Education	4
Arts Education	4
History	2
Physical Education and Health	1
Foreign languages	4
Social Sciences (e.g. economics)	7
Natural Sciences	11
Mathematics	20
Reading, Writing, Literature	9
Other (Music, Sport, ECDL, Metal...	16

Figure 10. *Division of teachers in Germany based on the subjects they teach*

consisted of participants aged 46 to 55 years; the smallest group (4 teachers) consisted of participants aged 26-35 years. As to the teaching experience, the majority were teachers with teaching experience of more than 10 years - 10 teachers (27%) had experience of 11-20 years, while 13 participants (35%) had more than 20 years of work experience.

As seen in the diagram (*Figure 10*) the overwhelming majority of the participants were teachers of mathematics - 20 and natural sciences - 11, ICT and Technology teachers - 14. The total number of responses in the survey is larger than the total number of participants, as each teacher could mark a number of subjects.

Teachers' motivation to join training and previous experience in the training area

For most of the teachers the motivation to participate was their willingness to act as a facilitator in their schools and help implement digital media in their everyday school life. Generally the teachers showed great interest in learning how the online collaboration tools can be used and also in getting ideas for the appropriate implementation of the acquired tools into their teaching and collaboration with colleagues. Additionally, some teachers indicated their specific interest in learning how to set up an e-learning platform for their school.

The pre-training survey shows that half of the participants have never used any online tools in their teaching practice. The proportion not using certain tools is particularly high, with 70% for online calendars and online meetings and 81% for social media. The confidence level of the participants in using online collaboration tools in their daily practice varies with different kind of tools. While half of the participants were confident in using online storage and mobile devices, only one quarter were confident in using common online applications, social media, online meeting tools and calendars as well as online learning environments. That is linked to the training experience of the teachers. 66% stated that they had not attended any formal training regarding digital media in the last years and 46% indicated that they had not received any informal training like peer education from colleagues.

Participants' pre-training skills assessment

The German participants took Barometer test before the first face-to-face meeting in order to identify the levels of knowledge and skills.

Results of Barometer test

- 🟦 Very Good (more than 90%)
- 🟧 Good (85%-90%)
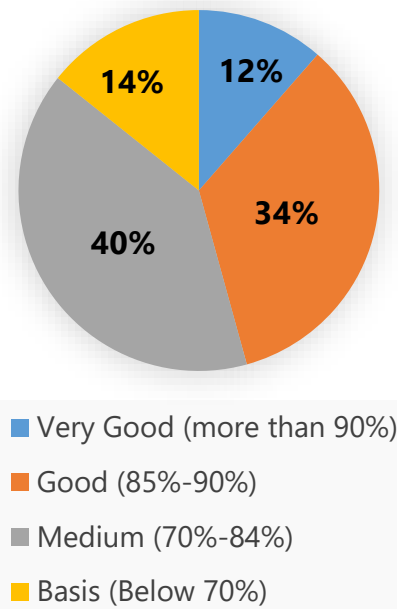- ⬜ Medium (70%-84%)
- 🟨 Basis (Below 70%)

Figure 11. *The results of participants' pre-training skills assessment in Germany*

The overall results show four levels: very good results with around 90% correct answers; good results with around 85% to 90% correct answers; medium results with 70% to 84% correct answers; and basic results with less than 70% correct answers.

A look into the three sections of the test shows that the participants had quite good general knowledge. Although only two of the 35 participants got 100% correct answers, the majority of participants had at least 70% right. Even better results were achieved in the section about webinars. Almost 70% of the participants were able to answer eight of ten questions correctly. However, the theme of mobile collaboration tools was evidently

more difficult because ten participants achieved less than 70% correct answers. Only one participant's rate in all three categories was less than 70% correct answers.

Training process organization

During the first meeting the participants got to know the trainers and what support they would provide as well as their fellow group members. After this introduction the course was shortly presented, the e-learning platform Moodle was shown and the role of the trainers discussed. Afterwards a representative of cooperation partner DLGI explained the requirements of ECDL exam. It was followed by a discussion of the concept "Online collaboration" and participants' previous experience. Then the groups were formed: five groups of five participants in Potsdam and three groups of four participants in Rodgau. The participants were grouped either according to interests, or to the level they teach - primary school teachers stayed in one group and teachers from vocational schools stayed in another group.

The face-to-face trainings were used to introduce the structure and organisation of the online learning phase rather than facilitating content-based training. They were meant to serve as orientation and motivation tool with question and answer sessions. During the final training session participants took the ECDL exam and presented their projects.

First training in Potsdam: participants get to know applications of e-learning platform Moodle

Nominating group leaders

Participants' opinion on the content

In Germany, the decision was made to provide a lot of information in unit 1; links where the participants could find content that interested them was the focus in unit 2; and in unit 3 the emphasis was on practical work and creating a project. At the start of unit 2 some participants felt confused but eventually got used to it and afterwards stated that they liked the different approaches. Furthermore, a weekly assignment was given - the participants had to write a kind of dairy about their learning process and how they liked the week. They often included information about their school activities, and analysed the assignments they had to do in the project and also how they cooperated with groupmates. The issue they complained about was their own time management skills and that they wanted to invest more time into the course. The trainers read the dairies and could if necessary react to them.

According to the dairies it appeared that week four - dealing with the mobile collaboration - was most interesting for the participants. Barometer test results proved that this was also the biggest weakness of most of the participants.

For those teachers who started the course with almost no knowledge in digital media the first unit was very difficult with much content to learn. However, those who started with a very good level could still profit from the variety of tools the course introduced and from the teaching methods.

Participants' practical work implementation examples

In Germany 29 participants got a certificate for graduating the course.

The projects developed by the groups focused on very different ideas and approaches: Some groups focussed on more practical instructions, other created a presentation of how they wanted to convince their schools and colleagues, and again others showed what must be considered when using online collaboration in schools.

Some examples:

■   Step-by-step instruction of how to set up an e-learning platform in a vocational school. The group implemented the platform and piloted it at their school.

■   Analysis of the new curriculum in the federal state and the necessity of online collaboration for schools. The group analysed preconditions and risks especially regarding the work with students, described the data security regulations, and considered what hardware and software can be used to implement the project.

■   Discussion of different tools for online collaboration and how they can be used in vocational education. The group created worksheets for their colleagues with instructions on what to do with the tools in class.

■   Analysis of the current situation with online collaboration in schools, the advantages and risks of this collaboration at schools, and preconditions for the use of digital media. The group created a step-by-step instruction of how to introduce Dropbox into their schools.

Results of ECDL certification

At the end of the training 27 participants passed the ECDL exam with good results (75% or more correct answers). According to participants' comments relatively more difficult questions were related to social networks.

Gabriel Heun, *Participant of the course:*

"Online4EDU was an enriching experience for me. I use the acquired knowledge often, especially for the common preparation of lessons or materials, on which several persons work together."

Barbara Pietzonka, *Principal and participant of the Online4EDU course:*

"I partially used the assignments of the course directly to transfer the preparations for lessons to the school computer without any hardware. Without the course I could not have done that."

Olaf Selg, *Trainer:*

"The combination of theoretical knowledge and practical online collaboration in three modules has been implemented very well. This was proved by the jointly developed and presented projects which help to practice the course content at school."

How can the program complement the Education system of the country?

The course fills a great gap in the German school system. Teachers are increasingly obliged to teach with and about digital media but are not educated to do so. The Online4EDU course trains teachers to apply online collaborations tools in education.

Latvia

Participants' information and selection process

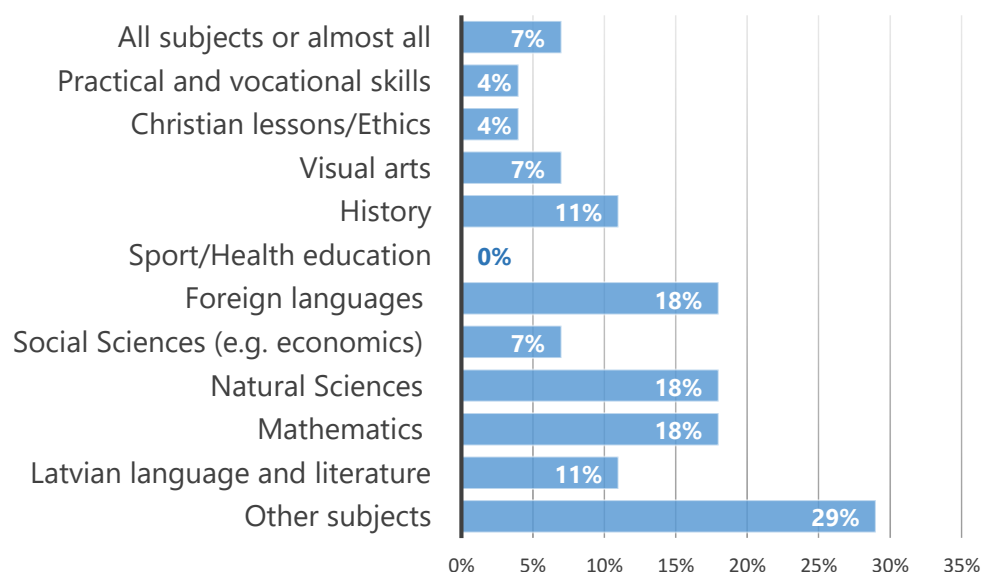There was an open call for the part-icipants in Latvia. Information about the possibility to participate in the pilot training, an invitation and an application form were published in the websites www.likta.lv, www.skolotajs.lv. The online registration form was delivered using the Office 365 component OneDrive Excel Survey. The total number of teachers who applied for the learning and who registered was 70. The selection was made on the basis of who registered first, and 34 teachers were invited to take part in the project.

Participants' profile

In Latvia 96% of the participants were women, and only 4% were men. 41% of participants were aged 46-55 years, and 25% of participants were aged 36 to 45 years. Majority of the participants were experienced teachers: according to the survey half of the participants had more than 20 years of teaching experience, while 25% of participants had teaching experience of 11-20 years.

Figure 12. *Division of teachers in Latvia based on the subjects they teach*

Division based on the subjects

Subject	Percentage
All subjects or almost all	7%
Practical and vocational skills	4%
Christian lessons/Ethics	4%
Visual arts	7%
History	11%
Sport/Health education	0%
Foreign languages	18%
Social Sciences (e.g. economics)	7%
Natural Sciences	18%
Mathematics	18%
Latvian language and literature	11%
Other subjects	29%

Teachers of various subjects took part in the training; almost one fifth - 18% of them - were teaching foreign languages, and the same number (18%) were teaching natural sciences and mathematics.

Teachers' motivation to join the project and previous experience in the training area

The prevalent reason why teachers applied for the project and wanted to participate in it was the opportunity to acquire new skills and knowledge in using online collaboration tools and mobile devices to use in the teaching process, as well as to improve their existing skills and supplement knowledge. Other stated reasons were to get inspiration for new ideas and to use acquired knowledge in future.

The possibility to take an ECDL exam and to receive the certificate if the exam is passed successfully was also an important motivator.

Participants' pre-training skills assessment

The Barometer test in Latvia was taken by 33 participants. As the diagram below shows the participants' knowledge on the relevant themes before the training was on very different levels - from very good (9% of the teachers) to only basic level knowledge (49%), but it did not affect the quality of their participation in the project. Barometer test results served as very useful information for trainers in their work with course participants.
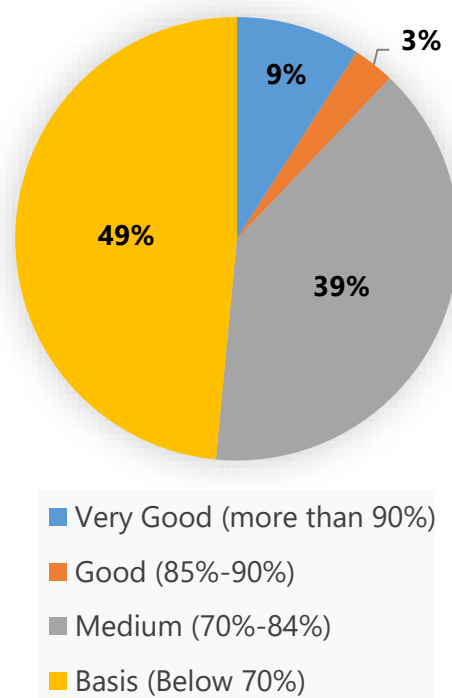
Results of Barometer test

Figure 13. *The results of participants' pre-training skills assessment in Latvia*

When analysing the participants' knowledge on each of the themes it may be added that, overall, the most correct answers were given on the theme of Mobile Collaboration (78% of all answers); "General knowledge about online Collaboration tools" was also relatively high (73%), while 60% of correct answers were received on the theme "Webinars".

Training process organization

The training process started with the first face-to-face meeting where all teachers and trainers met and the participants were

First face-to-face project's meeting. January 15, 2016

During the acquisition of Unit 1 and Unit 2, teachers did individual and groups tasks that they submitted for evaluation through the Moodle environment. During Unit 3 teachers developed projects in groups.

grouped in small groups - 4 to 5 teachers in each for performing group tasks in all three Modules.

After that the training process started by covering 3 units:

- Unit 1 - Technical aspects,
- Unit 2 - Methodological aspects,
- Unit 3 - Practice.

Each week's group leaders were chosen during the first face-to-face meeting. This leader was a driving force for group's teamwork in the chosen week. His/her activities were evaluated with a red badge, assigned by a trainer.

At the final face-to-face meeting participants took the ECDL exam, filled in post-course surveys and presented their projects in groups.

Group project presentation at final face-to-face meeting. April 1, 2016

Teachers and trainers at the final face-to-face meeting. April 1, 2016.

Participants' opinion on the content

The teachers considered that the most useful information gained during the project was on file storage and collaboration. Teachers created and shared documents for joint collaboration.

The most popular tool used for communication was Skype but there were also groups that used the Whatsapp mobile application. Teachers learned and used Padlet walls and Popplet mind maps with great enthusiasm as well. Teachers also learned how to create presentations with Sway, and used it for their project presentations at the final face-to-face meeting.

The most challenging and complicated topic for teachers was the organisation of webinars since there were limited options for almost all of free-of-charge webinar software.

Participants' practical work implementation examples

There were 30 successful graduates who received the certificate for completed training. Altogether 8 projects were developed covering a wide range of interesting themes.

Some examples:

■   An investigation of how to use online collaboration tools for teaching various subjects: e.g. Biology, Mathematics, Geography, Latvian Language, and History.

■   Examples how to develop collaboration skills using real life situations. The project's example was devoted to the acquisition of Latvian folklore.

■   Teaching English language involving pupils in active and joint creative tasks, and also in collaboration between pupils and teachers of two different schools.

■   Example of ideas of how to use online collaboration tools for the development of 21st century skills.

Results of ECDL certification

At the end of the training the ECDL test and the additional test were taken by 29 participants. 24 (83%) managed to successfully pass both tests (ECDL Online Collaboration and the Additional Test for Teachers) and get certified.

Ainārs Cauņa, *State Border Guard College, and trainer:*

"I would like to highlight some teaching methods - the grouping of the participants and the use of on-line tools for group work. I actively practice the newly acquired skills. By the way, learners love if there is something different and they can use IT. As a major benefit I would mention skills - e.g., to use smartphones in the learning process, conveniently and easily create a

variety of surveys. I am very grateful to the course organizers for the interesting range of tasks, and skill to organize a completely unknown people into creative workgroups".

Sintija Pūce,
Liepāja Raiņa Secondary school No 6:

"When applying for this project I really did not know if I needed it, or if it would be necessary in my professional development. When training started, I quickly realized that the provided tools not only allow "legally" use phones and tablets during the lessons, but also promote cooperation skills as well as develop the most essential skills - learning to learn. This is one of my biggest benefits since we practically tried out cooperation online, saw what problems can arise when using one or the other tool and looked for the ways to prevent those problems. The project inspired me and encouraged to change!"

How can the program complement the Education system of the country?

Online 4 EDU training program meets the requirements approved by the Cabinet regarding teacher training and can be used by institutions providing teacher training.

In order to integrate the results of Online4EDU project into the existing education system it is essential to provide information to respective stakeholders on the existence of the project, the developed program and its impact on teachers' professional development. Stakeholders include:

- Ministry of Education and Science;
- State Education Development Agency;
- National Centre for Education;
- State Education Quality Service;
- Local municipalities.

Lithuania

Participants' information and selection process

Information about the pilot training and invitation to participate was disseminated in various ways:

■   An invitation was published on the www.ecdl.lt and www.itmc.lt websites, as well as on the Facebook, where associations and active schools shared this post to the target group (educators).

■   A printable version (leaflet) of the invitation was used to disseminate information about pilot training. This leaflet was distributed at the seminars.

■   Information to the educators was also sent by emails.

The course registration form was published on the http://www.itmc.lt website.

Participants' profile

In Lithuania 46 teachers were involved in training, out of which 45 were women (98%) and only 1 participant was male. The majority of the teachers were 36-45 years old (43%).

Almost all participants were with long teaching practice: 16 had more than 20 years' experience, 16 teachers were with experience between 11 to 20 years, and only 4 teachers had 1 to 5 years of experience.

If we look at the subjects the participants teach, then the majority of the teachers (20%) taught almost all subjects (primary school teachers), 14% of the participants indicated that they are associated with the ICT and technology, as well as foreign language teaching, while 11% of participants pointed out that they teach science, mathematics, reading, writing, literature.

Teachers' motivation to join training and previous experience in the training area

All teachers were interested in participating in the pilot training because the theme "Online collaboration tools" is very important and useful in the education process.

The survey results show that more than half of the teachers had never used online storage, shared educational materials with students, or utilised calendars and virtual communication interfaces. Around 40% of teachers had never used other collaboration tools such as office applications, mobile devices and virtual training (learning) environments, which encourage cooperation between teachers and students, as well as encourage communication and collaboration between students, classes or schools. The most used tool is social media - about 14% of teachers use them every week and 16% of teachers use
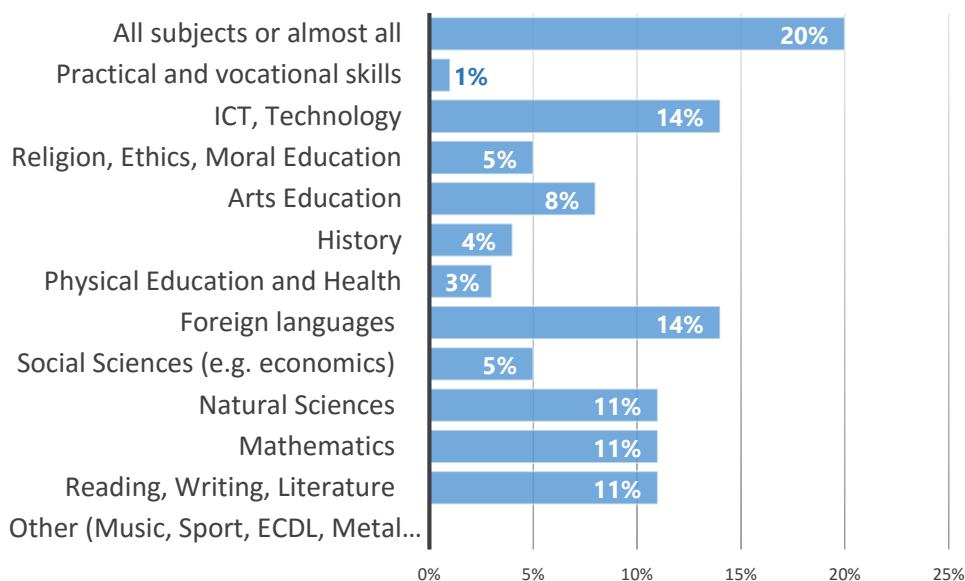
Division based on the subjects

Figure 14.
Division of teachers in Lithuania based on the subjects they teach

more than once a week, while 34% of respondents do not use them at all.

16% of teachers indicated that they use other communication and collaboration tools in their work, including an electronic diary, Email and YouTube videos.

More than 70% of the surveyed teachers stated that they do not have any knowledge at all or have a little knowledge about online storage, online calendars and virtual communication tools and office applications like Google Apps. Less than 70% do not have any knowledge (or have poor skills) about teaching (learning) environments.

About 52% of the respondents stated having a good or very good knowledge about social media; about 44% of the teachers have good knowledge about smart devices such as smart mobile phones and tablets.
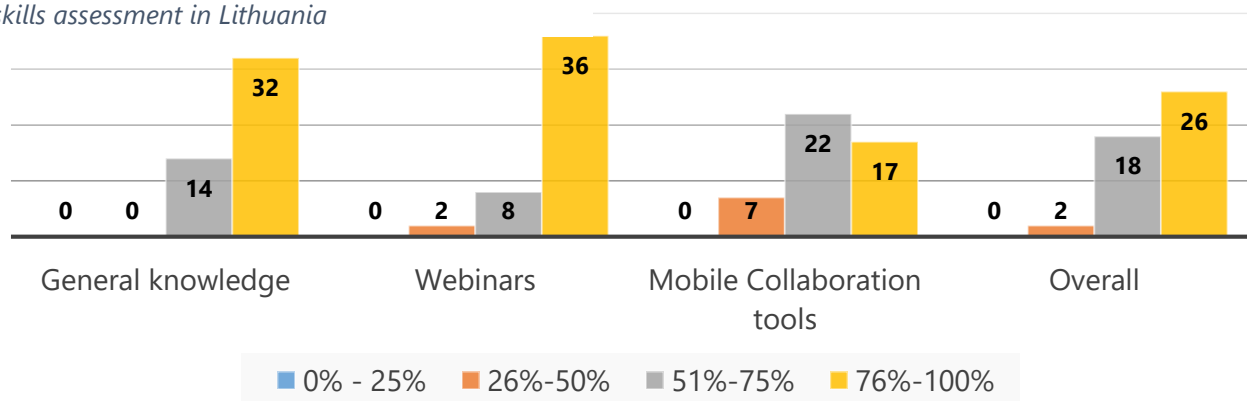
Participants' pre-training skills assessment

Teachers belonging to the age group 26 - 40 years had better knowledge compared to teachers who are over 55.

Training process organization

The pilot training process was organized by having two face-to-face meetings as well as online training using Moodle. The face-to-face meeting dates were set by using Doodle tool. In the first face-to -face meeting teachers and trainers got to know each other, the Online4EDU project was introduced, teachers' initial knowledge on online collaboration tools was identified by using Online4EDU barometer, and teachers' expectations regarding the Online4edu course were identified. Afterwards, teachers were organised into groups by using online tool TeamUp. Teachers also had a possibility to try some other online collaboration tools, such as a whiteboard (http://www.webwhite board.com/#at7tu7xk).

Figure 15. *The results of participants' pre-training skills assessment in Lithuania*

	General knowledge	Webinars	Mobile Collaboration tools	Overall
0% - 25%	0	0	0	0
26%-50%	0	2	7	2
51%-75%	14	8	22	18
76%-100%	32	36	17	26

First face-to-face workshop, ITMC training center, Kaunas

The second part of this meeting was used for training and discussions. Trainers introduced basics of online collaboration tools, showed how Moodle works, and demonstrated how to use online collaboration tools to perform course tasks.

The final face-to-face workshop had three goals.

The first was to invite teachers to demonstrate their final projects.

The second part of the meeting was dedicated to evaluation of teachers' knowledge and skills by completing:

- ECDL test "Online Collaboration" certification test;
- "Online Collaboration Tools in Education" additional test.

The final part of the meeting was dedicated to course evaluation. Teachers used online surveys and expressed their opinion about the training course, fulfilment of expectations etc.

Teachers demonstrate their projects

Final face-to-face workshop: first group, ITMC training center, Kaunas

Final face-to-face workshop: second group, ITMC training center, Kaunas

Participants' opinion on the content

The participants stated that the themes about computer clouds, file storage and sharing applications such as Google Drive and Dropbox were of the greatest interest. The themes about smart devices caused difficulties for some teachers, because not all of the teachers have smartphones or tablets and had never used them or had never used mobile applications.

All teachers completed the required tasks (one individual and one group assignment per part). Majority of the teachers completed more assignments than was required, which proves their interest. The most interesting and useful were the second and third part.

Collaboration in groups was a challenge for some participants as not all group members were responsive and kept to time appointments; therefore some participants admitted that it was easier to perform individual tasks than group assignments. Notwithstanding the fact that there were certain difficulties, the majority of the

teachers stated that the course was very useful; they acquired new knowledge, discovered new programs and felt that the course was appropriate to prepare for ECDL certification.

Participants' practical work implementation examples

The pilot training was successfully finished by 43 teachers who developed 13 varied projects: e.g. project "Book of the year" and guidelines for pupils "Be safe on the Facebook". The teachers demonstrated their project works showing how they used online collaboration tools, such as Skype for communication, Google disk for keeping and sharing documents, mind maps to identify ideas or other interactive environments, where the participants could communicate. Project works were presented by using innovative online presentation tools, such as Prezi.

Some projects were already accomplished; some of them could be used in the future by other teachers. As course participants were

very interested in each other's project works, they can be found on the website: http://www.ecdl.lt/naujienos/antrasis-online4edu-pilotiniu-mokymu-dalyviu-susitikimas

Results of ECDL certification

At the end of the training, 41 participant took the test, which consisted of two parts:

- A test of ECDL Online Collaboration;
- A test of Online Collaboration for Educators.

The results were very good, because both the tests were passed successfully by all participants. The graph shows the results in each of the tests. It should be noted that many participants showed a 100% result or gave more than 90% correct answers, which is a very good achievement. For a test to be passed, the teachers had to reach 75% correct answers.
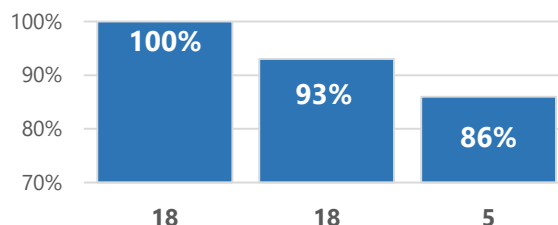

Figure 17. *Participants' pass rate of Online Collaboration for Educators test in Lithuania*

Elvyra Sabaliauskienė, *Participant from KTU Engineering Lyceum*

"Online4Edu pilot training course was very interesting and useful because of the variety of tools we could get acquainted with. There is a plan in the next school year to collaborate with other schools conducting integrated lessons by using Skype. Personal experience by using Google Drive encouraged to invite colleagues to edit documents online in real time instead of sending them by email."
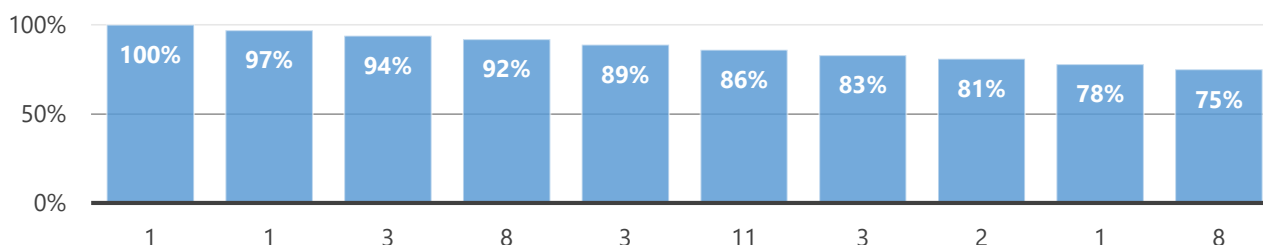

Figure 16. *Participants' pass rate of Online Collaboration test in Lithuania*

Renata Babravičienė ir Aušra Bezujevskienė, *Participants from Lithuania Millennium gymnasium*

"The work was really fun, interesting and useful. We have pupils, that learn at home, that are curious and looking for the additional information, so we already apply the acquired knowledge at our work. All the parts of training course were useful, but the most relevant and interesting were second and third part."

Loreta Križinauskienė, *Director of Association "Langas į ateitį"*:

"We believe that this course is very important and relevant for the community of school educators as well as for all ICT users of Lithuania as it seeks to improve the trainee's knowledge about the services, working methods and tools of cloud computing, data protection, privacy, e-safety and e-protection, intellectual property rights, collaboration tools, etc. It directly contributes to the development of the knowledge society of our country and corresponds to one of the most important goals of the National Digital Coalition - to improve conditions of acquiring and constantly improving ICT skills necessary for jobs, IT business and digital market development."

How can the program complement the Education system of the country?

In order to integrate Online4EDU project results into the existing education system it is important to introduce it to the Education Development Centre of the Ministry of Education and Science. This organisation plays a major role in the educational system-developing the general education curriculum and teacher training programmes, and implementing continuing adult education. The same applies to the Centre for Information Technologies in Education (CITE) under the Ministry of Education and Science as it is the organisation in charge of projects for ICT introduction into general education and vocational education and training.

The Lithuanian Distance Learning Network (LieDM) provides distance learning courses in various areas so it will be suggested to include Online4EDU training and certification system into the LieDM offer list.

Contacts with various teachers' associations and other professional organisations such as the Association of Lithuanian Teachers of Informatics and the Lithuanian Computer Society could also be used to promote the developed training program.

Conclusions and recommendations

■ Surveys conducted in EU states show that online tools are not regularly and widely used by teachers. Therefore training specifically focusing on the acquisition of concrete skills and their practical application is urgently needed. From the pilot training and evaluation results, it can be concluded that the developed programme has a positive impact on teachers' skills and confidence regarding the use of online collaboration tools in teaching and when interacting with students, colleagues and parents.

■ The teachers who participated in the pilot training represented different backgrounds, demonstrating that the course is suitable for teachers of general and vocational education, teachers of various age groups, and teachers of a range of school subjects. Thus, these teachers can use their acquired skills to enrich teaching and learning in all school subjects on different levels.

■ To successfully participate in the training, participants should have basic ICT skills. However, previous knowledge on online collaboration tools is optional. The pilot training demonstrated that teachers without prior knowledge or with very limited knowledge and skills on the use of online collaboration tools can successfully participate in the training process.

■ It is important that results can be objectively measured. At the end of the training the pilot participants demonstrated their knowledge and skills in two tests - the ECDL Online Collaboration test and the Online Collaboration Tools in Education tests.

■ The participants' test performance was very positive. The high pass rate among the participants (91.4% for the ECDL Online Collaboration test and 94.9% for the Online Collaboration Tools in Education test) proves the impact of the programme on participants' skills development.

■ The participants' feedback also displays a positive increase of confidence level regarding the use of online collaborative tools.

■ The results as well as participants' feedback show that the training approach – a blended learning methodology including face-to-face, e-learning, and group work - was successfully developed and implemented by the project partners.

■ The developed training material and the training system help to enhance teachers' ICT skills to be applied in their professional

practice. The developed specific training approach can be successfully used to organize training for other groups, not only during the pilot training in participating countries, but also through adaptation in other European countries.

■ Trainers have a very important role in the course implementation process. They should be not only knowledgeable in the field of ICT, but also possess excellent skills relating to communication, adult learning, and e-learning organisation and management.

■ Given the blended approach that combines face to face training, with independent and group work, it is crucial to keep participants motivated throughout the training process.

■ The developed training materials are up-to-date and provide a comprehensive insight into online collaboration tools and their application to the learning process - because technologies are constantly advancing, they can be updated over time.

■ Tools and training materials developed in the project are available to a general audience:

- The Online Collaboration skills barometer can be used before starting training to help people estimate their online collaboration skills, and evaluate their knowledge about online collaboration, and receive direct results and recommendations for improvement. The barometer is available online in 5 languages (English, Estonian, Latvian, Lithuanian and German) and can be used by anyone: http://dev.ecdl.lt/project/on-line4edu/index.php?lang=en

- The ECDL Online Collaboration test and the Online Collaboration Tools in Education can be taken by contacting the ECDL testing centres in countries offering the programme.

- Each project partner state will provide open access to training curriculum, placing it on the web site http://online4edu.eu.

■ The on-line training platform and blended learning approach that lie at the centre of the training process provides easy access to training resources; trainer support; flexible, personalized learning; and social interaction. This helps retain participants' interest in the training process, promotes the acquisition of new skills relating to online collaboration tools, and strengthens confidence in using them.

■ The developed curricula, training materials and tools can be used not only for general and vocational education teacher training, but also implemented in life-long education processes for various target groups, for example, librarians, social workers, career counsellors, etc.

Project partner profiles

BCS KOOLITUS

BCS KOOLITUS is an ICT training and consulting company, which offers services to ICT users including teachers, specialists and managers. Our selection of services is varied: different refresher trainings, education methodology trainings, consultations, certifications and conducting development events in ICT.

We offer a full training process starting from the assessment of training needs till measuring the training results.

Our mission is to be a long-term partner to our target group through seminars, consultations and trainings to put the IT-systems into effective use.

BCS Koolitus carries the title of Prometric, ECDL and Pearson VUE worldwide certification centre. BCS Koolitus is also the awarding body of the professional occupational qualifications in the field of IT in Estonia.

Web page: www.bcskoolitus.ee

ECDL Foundation

ECDL Foundation is the certifying authority of the leading international computer skills certification programme - ECDL / ICDL. The quality and reputation of our certification programmes are built on over a decade of experience in successfully delivering ICT certification programmes to millions of people in various languages around the world.

Web page: www.ecdl.org

LIKTA
Latvian Information and Communications Technology Association

ECDL
Lithuania

Latvian Information and communications technology association – LIKTA

Latvian Information and communications technology association (LIKTA) was founded in 1998 and it unites leading industry companies and organizations, as well as ICT professionals - more than 160 members in total.

The goal of LIKTA is to foster growth of ICT sector in Latvia by promoting the development of information society and ICT education thus increasing the competitiveness of Latvia on a global scale. The association provides professional opinion to government institutions on legislation and other issues related to the industry, while also maintaining close relationships with other Latvian NGOs and international ICT associations.

Web page: www.likta.lv

Public institution Information Technologies Institute (ITI)

Public institution Information Technologies Institute (ITI) was established in 1997 and started as an organization which creates temporary professional working groups for projects on Information System design. The full-time staff of ITI includes administrative, financial and project managers (5-10 persons). ITI has strong experience in IT training/testing courseware design and development.

From year 2000 ITI started with ECDL (European Computer Driving License) Programme implementation in Lithuania. Now ITI is the official ECDL Foundation Sub-licensee for Lithuania. Currently the development and dissemination of computer literacy related training/testing systems have the major importance for the Institute. ITI has developed the Automated ECDL Test System which is authorised by the ECDL Foundation. The In-Application testing based version of the Test System has entered the official authorization process at the ECDL Foundation level also. In 2009 ITI has launched the ECDL Foundation Endorsed Partner Programme e-Guardian. Currently ITI is involved in development of Learning/Testing solutions for ECDL, e-Citizen, CAD, security and children

safety subjects in Lithuanian, Latvian, Estonian, Azeri and English languages.

From November 2013 ITI (ECDL Lithuania) is involved as a stakeholder in the National Digital Coalition for the Promotion of Digital Skills for Jobs in Lithuania (www.skaitmeninekoalicija.lt/en/).

Web page: www.ecdl.lt

Stiftung Digitale Chancen

The goal of the Stiftung Digitale Chancen (Digital Opportunities Foundation) is to make people interested in the Internet and to support them with their steps into the digital world. We want them to become aware of the opportunities this digital medium offers and to make use of them. Stiftung Digitale Chancen was founded in January 2002 in Berlin by AOL Germany and the University of Bremen. Co-founders are Accenture and the Burda Foundation. The Federal Ministry of Economics and Technology and the Federal Ministry of Family Affairs, Senior Citizens, Women and Youth have taken on the patronage.

Web page: www.digitale-chancen.de

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Notes

Project partners

BCS Koolitus

ECDL Foundation

LIKTA
Latvian Information
and Communications
Technology Association

ECDL Lithuania

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digitale-chancen**