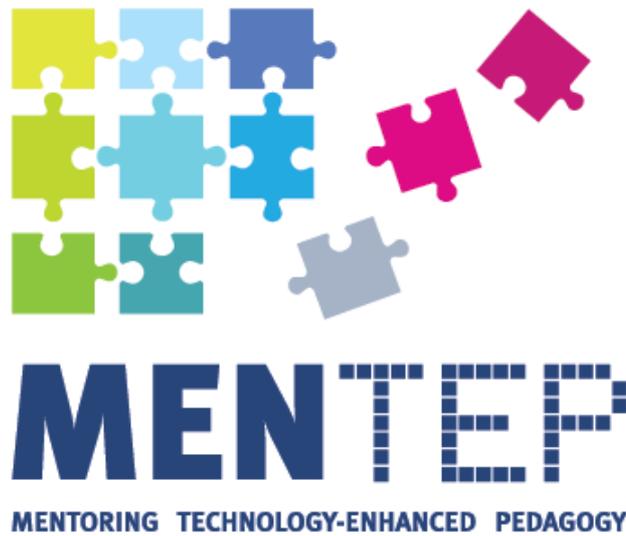


<http://mentep.eun.org/>



Certification of teachers' digital competence Current approaches and future opportunities

MENTEP Deliverable 6.1

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INTRODUCTION

The MENTEP (MENToring Technology-Enhanced Pedagogy) project is a European Policy Experimentation funded by the European Commission via the Erasmus+ programme. MENTEP addresses the need in EU policies for teachers able to innovate using ICT and for improved data on their digital competence. It also tackles the need to enhance the uptake of ICT in teaching and learning, to promote stronger coherence between different EU and national transparency and recognition tools, and strengthen the professional profile of the teaching profession.

MENTEP aims to build teachers' competence in the pedagogical application of digital technology through the use of a self-assessment tool linked to competence development opportunities and to assess its impact. In order to achieve this, a sound understanding is needed of current approaches to teachers' professional development (PD) and its certification in general, in digital competence in particular, and of promising innovations that could have more widespread value. MENTEP Work Package 6, task 1 is devoted to this aim:

Under the lead of INDIRE (IT), EUN will analyse existing successful international and/or EU certification instruments in education with the aim of identifying what the key conditions and characteristics of their success are, i.e. broad uptake of such tools by target groups and recognition by large educational circles. Desk research and (Skype type) interviews have been used and one European-wide level national public authority meeting implemented in M7, for identifying the intrinsic characteristics of the instruments and the contextual conditions contributing to their success.

This report brings together the results of this work and includes a detailed picture of the current state of teachers' professional development and certification models in countries represented in MENTEP, together with an overview of national innovations (chapters 2 to 4) and desk research into existing certification models (described in chapter 5).

Both the desk research and the survey underpin the second task in MENTEP Work Package 6: Task 6.2: a mini-prototype for a technology-enhanced interactive certification instrument/M12-34:

The user friendliness and attractiveness of an EU certification tool can contribute to its success. TET-SAT, as used in the field trials, will use an interactive technology to offer the self-test online through a dynamic bank of descriptive items, delivering in real time badges, certificates and visualisation graphs (spider type) of teachers' competence levels in the control and test groups. Under the lead of INDIRE and external highly specialised expertise (sub contracting), the certification instrument will investigate during M12-34 a more advanced and powerful use of technology by including/embedding into the test, simulations, images and animations within a

virtual mini-environment, providing teachers with a more engaging experience close to real teaching the classroom situation. WP9 describes the technical implementation in more detail.

While promising, attractive and suitable for a joint effort at EU level, this part of the project will be kept realistic according to the timeframe and funding available. It will therefore focus only on one specific aspect of TET competence (e.g. leadership in a digital environment, co-construction of content by using social media) and will not be tested in the field trials but discussed in a first demo in M23. It nevertheless deserves to be part of the present project because of its potential for mainstreaming at system level and comparison between education systems.

Chapter 6 brings together some conclusions and recommendations from the investigations with such a mini-prototype in mind.

Thanks are due to the many contributors to this report, in particular the members of the MENTEP consortium and associated experts, whose knowledge and insights were invaluable in compiling the analysis and shaping the recommendations.

1. Survey design and methodology

The survey was developed following discussions with MENTEP partners to identify key topics to be investigated. An online survey was created and tested (at <https://www.surveymonkey.com/r/ZSCPQG5>). It comprised 19 items organised in three sections: professional development of teachers, certification, and developing and assessing teachers' digital competence (see Annex).

Responses were collected between January and May 2016, and supplemented with Skype interviews in April-May 2016 with each MENTEP ministry or national agency partner contributing to the survey. All partners responded, giving a total of 14 countries represented in the survey: France, Estonia, Greece, Czech Republic, Italy, Cyprus, Lithuania, Spain, Denmark, Slovenia, Finland, Portugal, Norway, Scotland. Scotland, although not a partner in the MENTEP project, was invited to take part in the survey on account of a major effort to develop teachers' competences and innovative approaches in that country.

From this data, an overall picture of the topics was obtained, described in the following sections, and country profiles produced for each country, described in the Annex. This is described in chapters 1 to 3. Although respondents are in ministries and national bodies, their responses may not reflect official government policy.

2. Teachers' professional development policy and practice

The first part of the survey (questions 1-10) looked at professional development (PD) in general: relationship to salary or promotion, providers, modes and compulsory elements.

Is professional development linked to salary increases or promotion?

In most countries professional development is linked to either a pay increase or promotion as seen in fig. 1. Only in Scotland, Czech Republic, Finland and France is it not linked.

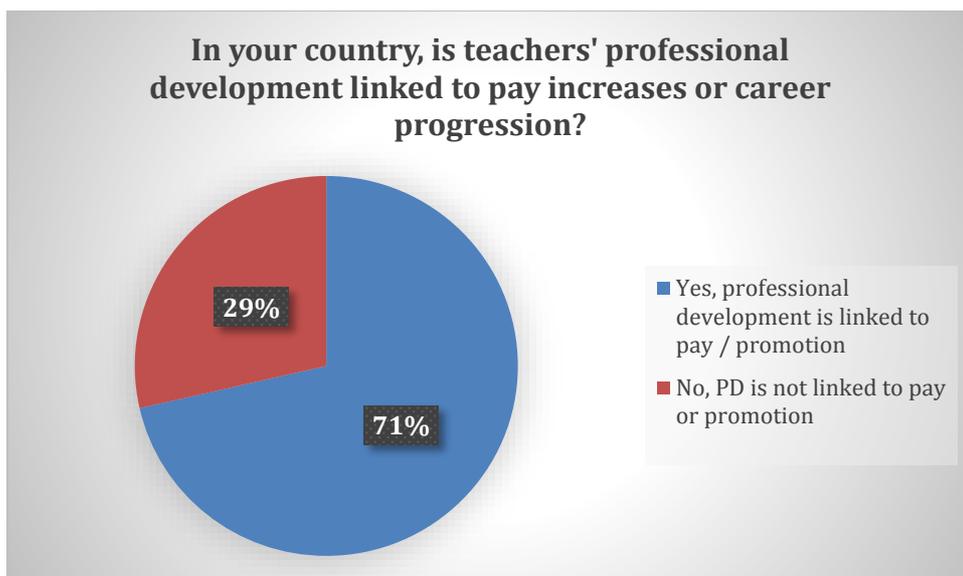


Figure 1: Is PD linked to pay or promotion?

The relationship varies in the ten countries where PD is linked: it can lead to salary increases, promotion or a mixture of the two.

A salary increase may follow successful PD completion in Norway (but not automatically), Estonia (until recently), Greece (if the PD is a post-graduate degree), Lithuania, Spain and Denmark. In Estonia the government has recently stopped linking PD to pay rises as it was felt that teachers tended to collect certificates and diplomas in order to obtain a small salary increase rather to develop competences and knowledge.

It is linked only to promotion in Italy, Cyprus, Slovenia and Portugal. PD in Cyprus is linked to promotion because professional development is considered a positive indicator in the evaluation of teachers' performance (it counts more as a qualitative than a quantitative indicator (there are three quantitative indicators: years of experience, qualifications, evaluation). In the past year a pilot PD programme was introduced in which professional learning will be obligatory, and subsequently linked to promotion, for teachers based on credits acquired over periods of two years). In Slovenia, teachers who attend seminars/professional development courses receive a certificate which includes points according to the duration of the seminar (8 hours = 0.5 points). When they apply for promotion, professional development courses are a part of the various criteria taken into account. Teachers need a certain number of points from PD courses for different levels of promotion: Teacher Mentor: 4 points; Teacher Advisor: 5 points and Teacher Expert: 7 points. Every two years, Portuguese teachers need to have at least two credits in order to further their career. This progression is made on average every four years, but it was suspended in 2011 due to the financial crisis.

In Greece, postgraduate degrees are linked to a (small) salary increase and also provide "plus" points for administrative positions and secondments.

In Italy according to the Law 107/2015, a 500 euro bonus is given annually to all teachers, regardless of their performance in the classroom. It may be used only for cultural activities (e.g. theatre, books, cinema, software, courses, conferences). Temporary teachers can gain points which are useful for becoming permanent teachers by attending courses provided by institutional providers accredited by the Ministry of Education.

In Lithuania, CPD hours are essential for the process of certification leading to a rise in a teacher's qualification category (teacher, senior teacher, supervisor (methodologist), expert teacher). The qualification category obtained is directly linked to a pay rise or promotion.

In Spain, training and professional development certified by national or regional education administrations is taken into account for pay increases every six years, awarded if the teacher has completed the minimum hours' training hours or credits during that period of time. The minimum hours stipulation is not the same in all the regions. As far as promotion is concerned, training is valuable and helpful preparation for jobs in the official administration, like head teacher (also the case in Finland and other countries). On the other hand, for some other posts, training is not required though it may be taken into consideration.

In Denmark, Professional Development can be linked to a small increase in pay or lead to new areas of responsibility, depending on what kind of PD is undertaken.

Who provides PD?

In all 14 countries universities play a role in PD and are the most frequently mentioned provider (fig. 2), followed closely by the ministry of education itself. In most countries public bodies, regional centres and commercial providers also play a role. Self-organised PD or training organised by teachers themselves features in nine countries.

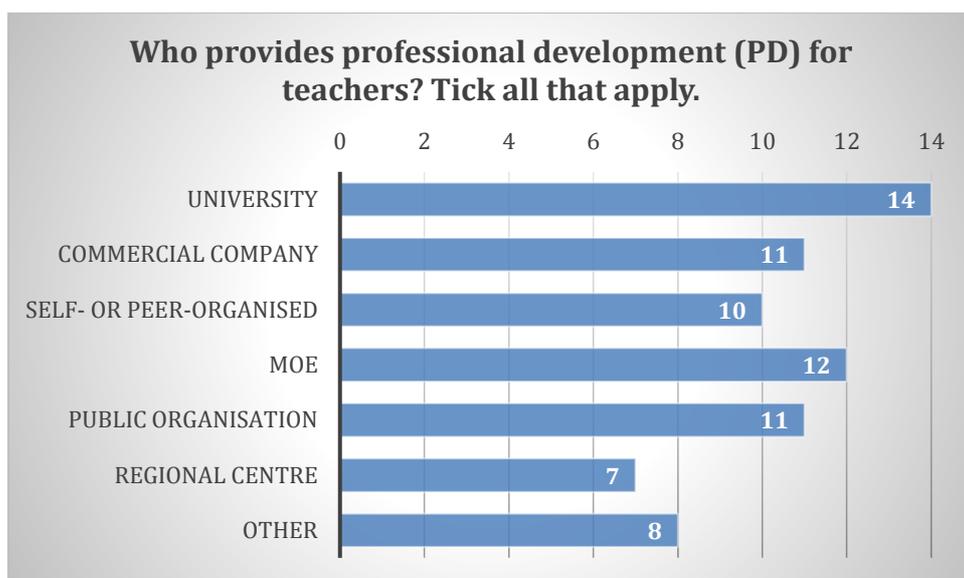


Figure 2: PD providers

Other providers include the following:

- Scotland: the General Teaching Council of Scotland, professional associations (teacher unions);
- France: the Réseau Canopé (canopé network), a specifically French organisation under the supervision of the ministry of education operates nationwide and, among others, provides PD for both primary and secondary school teachers;
- Greece: school advisors and counsellors;
- Italy: the Ministry of Education (and INDIRE) provide PD in the first year of teaching;
- Lithuania: non-Governmental Organisations, international organizations;
- Spain: professional associations;
- Finland: the Ministry of Education differs from the rest of the alternatives in that it does not directly provide PD in practice, but instead provides funding for organisations that do;
- Portugal: certified Teacher training centres (unions, professional associations, local teacher trainer centres based on schools).
- Cyprus: the Cyprus Pedagogical Institute (the Ministry's appointed department for teachers' professional development).

Where and how is professional development provided?

Professional development is provided in a range of places, particularly in schools, but also in public centres, hotels and conference centres (fig.3). Online courses (or blended courses with an online element) are available in all countries. Courses vary in duration from shorter than one day to long courses (for example a post-graduate degree course lasting several years). In addition, long and short-term internships are available in Lithuania, intensive one-week summer courses take place in Spain, and in Portugal

courses usually take place after school in sessions of 2-3 hours on several days over the span of 1-2 months.

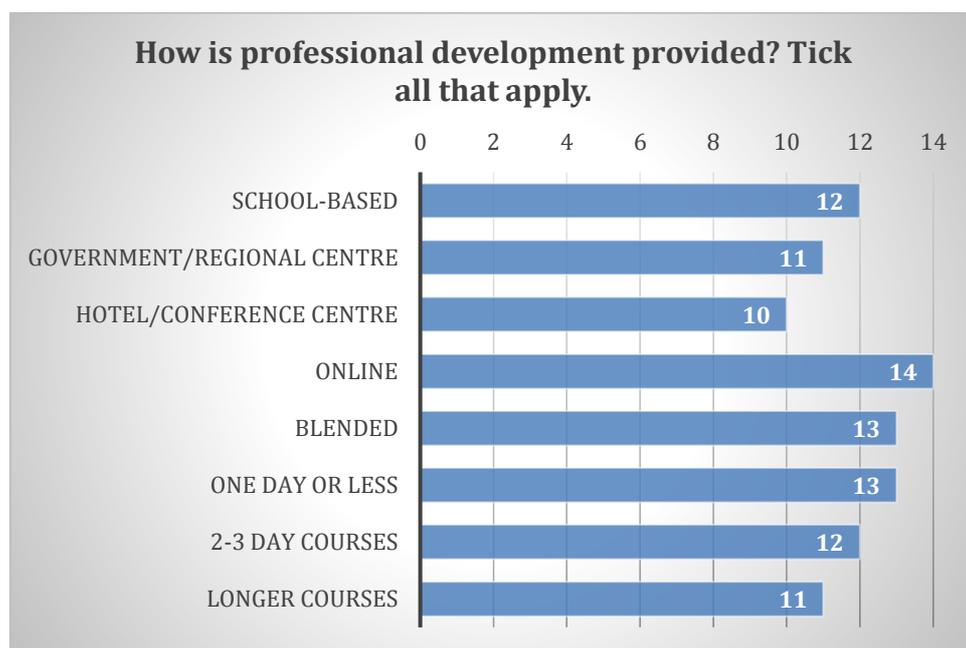


Figure 3: Modes of PD provision

Is professional development compulsory?

In most countries, some form of PD is compulsory for teachers, as seen in fig. 4, but in five countries surveyed it is not.

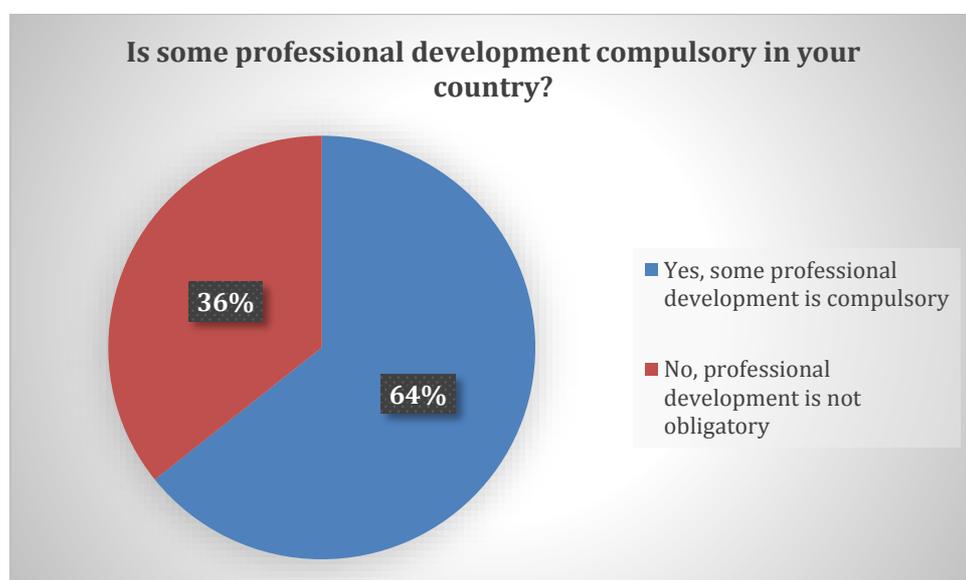


Figure 4: Is PD compulsory?

In some countries the amount of compulsory time to be spent on PD is specified. It

ranges from 12 days' PD a year in the Czech Republic but more typically it is between two and six days a year. In Scotland for example, all teachers have a requirement to complete 35 hours CPD each year in their contracts, and in Finland three compulsory PD days are specified in the Collective Agreement for Teachers but the type of PD is not restricted; these activities are estimated at 20 hours' work (mostly face-to-face, with an online element). In Cyprus, school based two day seminars are compulsory for all teachers every year, while for newly promoted head teachers (primary and secondary education) and newly promoted deputy head teachers (secondary education) a whole year programme with one day meetings every week is also compulsory. In Lithuania a teacher has a right to spend five days a year studying for a PhD (but this is not compulsory). In Finland, 18 hours (i.e. 3 days) are specified as compulsory PD in a Collective Agreement and in Portugal teachers are expected to complete 50 hours of training every two years. In Italy, during a teachers' induction period, 50 hours of training during the year must be undertaken. Training in Italy comprises a range of activities – face-to-face courses, online activities, peer tutoring activities – and for the online training, only the submission of at least two activity reports to the online platform during the year is compulsory.

In some countries, restrictions are placed on teachers' choice of CPD courses. In France, for example, some courses linked to renovated curricula or new educational laws are compulsory. Teachers in Portugal are obliged to follow PD courses for some curriculum areas only, according to the disciplines that teachers can teach and only centrally approved courses. In Italy induction PD is tightly controlled: newly-qualified teachers must attend at least 12 hours' face-to-face courses on eight areas of content, carry out a series of activities and projects in classroom under the supervision of a classroom tutor, register on the online platform INDIRE Neoassunti and fill in a self-assessment form at the beginning and at the end of the year (this form is evaluated by the tutor and by the School Evaluation Committee). However, once in service, PD in Italy is not compulsory, although the 107/2015 Law strongly recommends PD (modalities are still to be defined).

In other countries there is more flexibility. In the Czech Republic, for example, the form (self-study, training, etc.) as well as the content of teachers' professional development is under the authority of head teacher. In Scotland the only restrictions are the availability of finance and teacher supply cover. In Cyprus, with the newly introduced scheme, compulsory PD is arranged by each school according to its needs; at the same time, inspectors are organising training based on subject area needs. CPD courses in Lithuania can be financed from the "Pupil's Basket" (state financing) if they are delivered by accredited or approved organizations only. If a different provider is chosen, the school cannot use the Pupil Basket. In Finland there is no restriction as regards the type or topic of PD; what is considered eligible depends on the municipality or school.

Some MOOCs and online courses are compulsory for teachers in three countries (fig.5):

in France (e.g. magistere.education.fr) and Portugal, where, in both cases, teachers may enrol for certain courses only, and in Scotland, where there is no restriction on the choice of course.

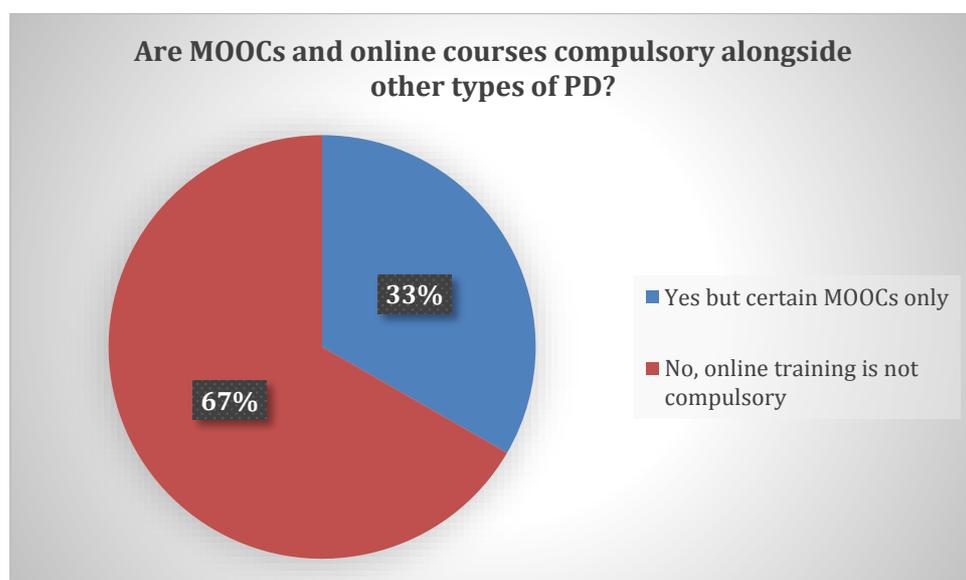


Figure 5: Are any online courses compulsory?

Country reports

The following reports provide additional detail and are compiled from the survey and follow-up interviews with national contacts.

Cyprus

In Cyprus continuing professional development (CPD) is officially provided by the Cyprus Pedagogical Institute (CPI), the Ministry department responsible for teacher PD. CPI offers training programmes in close collaboration with the education directorates of the Ministry and their inspectorates. At the same time academic and other institutions and associations offer a range of PD opportunities for the teachers to attend. PD is linked to promotion in a more qualitative than quantitative way. Training programmes are offered centralised but in recent years more school-based face-to-face training is taking place. With the newly introduced professional learning scheme, school based PD is becoming compulsory.

In the first 12 years of their career, teachers are expected to develop their competences and knowledge through masters' degrees, seminar participation, taking part in European Commission-funded projects or skills courses such as the European Computer Driving Licence. Only teachers with 12 years' or more experience may apply for new positions, as a head teacher for example. Once appointed, all school principals as well as deputy heads have to undergo further training by attending a one year face-to-face course one day a week out of school at the Pedagogical Institute.

For the last three years a new system has been in place and is working well: all teachers undergo two days' training (secondary education teachers every January and primary education teachers every September). During these two days, schools work without any students – and teachers tend to be more relaxed and open to new ideas.

Courses are provided by universities and public organisations, notably the Pedagogical Institute. The Institute publishes a directory of courses at the beginning of the school year from which teachers may choose courses. Their training, typically for three hours in afternoons over five weeks, takes place at sites around the country, specific locations depending on demand. In addition, schools may organise training to meet specific needs in the school. Occasionally the head teacher and subject inspector may suggest a teacher follow a particular course, perhaps because of disciplinary problems in the classroom, but this only works if the teacher acknowledges there is a problem and actively engage in addressing it.

Czech Republic

In the Czech Republic professional development is not linked in any way to a salary increase or promotion, although the career system is under review. Head teachers choose staff from within the school for positions of higher responsibility (e.g. head of subject), based on their teaching results and the opinion of other teachers. Head teachers are appointed following open calls and criteria include being a skilled teacher (the minimum length of teaching practice is defined by a law, for example at least four years in case of primary school heads) and knowledge of the education system. Completion of the special further professional training for school management is one of the preconditions for being appointed (or this training has to be completed within two years of the appointment). The training takes approx. one year, includes about 120 hours. It is also possible to graduate at bachelor / master studies dedicated to school management.

All teachers are expected to undergo 12 compulsory days' PD a year, by law, as part of their job. PD is under the authority of the head teacher. PD can take the form of self-study or participation in courses, seminars, conferences and so on (depending on the teacher's choice and head teacher's approval). Self-study usually represents the substantial part of this training. According to TALIS 2013 (National Report), the courses/seminars belong to the most frequently attended form of PD (almost 70 % of teachers participated in this type of training in previous year in comparison to approx. 20 % in case of conferences) and take about 5-6 days a year on average¹. Teachers themselves can choose from a wide range of courses, many listed in an annual directory published by the national institute for professional development. Other courses are offered by universities (offering not accredited, popular high quality courses),

¹ <http://www.csicr.cz/html/TALIS2013-NZ/flipviewerxpress.html>, p. 23, in Czech

commercial providers (charging a fee, and sometimes product-related training), textbook publishers and public organisations. Consequently, head teachers are subject to a stream of emails offering courses. Most courses are free and these are naturally preferred over fee-charging training. Official documents set out the structure of CPD and analyse popular topics.

Few courses are online, but some teachers are beginning to be more interested in this form of training; therefore the scope of events of this type is gradually increasing - particularly webinars and Moodle courses such as eTwinning webinars, webinars organised within Metodický portál rvp.cz (Methodological portal initiated by Ministry of Education, Youth and Sports which provides space for sharing OER and experience of teachers). Some universities also provide on-line courses. The University of Brno is developing a MOOC, to be offered to the public (including teachers) and more are expected.

Denmark

In Denmark, professional development is not compulsory but depending on the type of PD it may be linked to a small increase in pay or lead to new areas of responsibility.

Estonia

Professional development is linked to pay and promotion. If teachers receive a diploma or certification on completion of a course, they are given a small pay rise.. However, teachers are 'collecting' certification, rather than building knowledge and competence and so the government has stopped paying extra salaries.

Professional development (PD) for teachers is provided by universities and the ministry of education. Courses take place in a hotel or conference centre, and there is also online and blended training. Some professional development is compulsory. Courses may last up to a year but compulsory courses are face-to-face and last from one day or less to three days.

Finland

Professional development is not linked to pay or career. Three compulsory PD days are specified in the Collective Agreement for Teachers but the type of PD is not restricted.

France

Professional development is not linked either to pay or promotion. Providers of PD include universities, commercial organisations, and, particularly, through the 'Réseau Canopé' (canopé network), a specifically French organisation with centres in all academic districts which aims to train both primary and secondary school teachers. PD is provided in a range of modes, including school-and centre-based, face-to-face, online

and blended. Some PD is compulsory: training related to new or updated curricula or new education laws. Such obligatory courses can include MOOCs.

Greece

Professional development is linked to pay or promotion but is not obligatory in Greece. There are however incentives to encourage PD take-up, and besides, most teachers generally want to improve, with or without incentives. Post-graduate degrees are linked to small salary increases and provide 'plus' points (= credits) taken into account when applying for administrative posts in schools, for example to be a head teacher (considered to be an administrative role).

The ministry of education has developed a strict framework for PD which it controls. Courses are approved by the ministry, or its regional education directorates, and organisations it supervises (e.g. CTI, the Computer Technology Institute), or universities (in the case of their own courses). CTI, in collaboration with the ministry and other supervised organizations, designs courses – for example a major CPD course on ICT for teachers – and advises the ministry on ICT and CPD.

There are laws to address teacher supply issues, including temporary fixed-term contracts. There are teacher unions in Greece but, although there are strikes and positions expressed on changes, they have no formal role in CPD and certification.

Universities offer post-graduate programmes leading to Master's degrees and there are pilot MOOCs for teachers in post run by universities. Within the framework of B-level programme (see below), teacher educators are being trained in specialist academic centres around the country. In addition to the full range of professional development providers, there are school advisers / counsellors (who used to be called inspectors) who provide subject-related training for all teachers of a particular curriculum subject.

Lithuania

Professional development is linked to pay or career development. According to the Law on Education, every teacher is obliged to develop his/her professional competencies. A teacher is entitled to five PD days a year. In order for a teacher to move up a qualification category (teacher, senior teacher, supervisor (methodologist), expert teacher), 'Continuous Professional Development (CPD) hours' are essential for the process of certification. Once qualified for a higher category, a teacher receives a salary increase or promotion.

CPD courses can be financed from the 'Pupil's Basket' (using the state budget) only if they are delivered by accredited or approved organisations. If another CPD provider is chosen, school cannot use the Pupil's Basket to fund it.

Norway

In Norway, much professional development is linked to pay and / or promotion. The salary of Norwegian teachers is calculated on years of service (up unto a maximum of 16

years) and the level of education (up unto a maximum of 360 credits). However Norwegian teachers often engage in professional development for intrinsic self-motivated reasons, finding developing their competence and professional skills personally gratifying, rewarding in itself.

Training is provided by universities, commercial organisation or is self-/peer-organised. If a course is provided by a university (higher level qualifications, e.g. master's) or college (bachelor level), credits are awarded on successful completion.

Teacher unions are relatively strong in Norway (80 percent of teachers belong to one union, and there are smaller ones) and their policy is for all professional development to be recognised formally and linked to pay or progression. The situation is changing as schools become more autonomous from central government and local budgets are devolved, so that schools now meet the costs of training, including 'supply cover' for teachers when they are undergoing CPD. Head teachers can now award discretionary pay rises to individual teachers, but only with the unions' agreement who have agreements locally (with municipalities) and nationally. A new model of CPD is emerging where the state pays 50 percent of the cost of accredited courses, the municipality 25 percent and teachers themselves the remaining 25 percent.

Although professional development is not obligatory, head teachers can apply pressure on a teacher to undertake training.

All types of course are available but those that are not provided by universities or colleges are not linked to pay or progression. Municipalities or groups of teachers often run one-day courses for example.

There is some online training in Norway, in particular a MOOC running from September 2015 to June 2016 for teachers of mathematics. They work collaboratively on end of unit papers but the final assessment is based on an assignment produced individually at home with access to all resources, submitted on paper and assessed by experts or university staff who grade it and award credits. Online testing is organized by the course provider who also validates identity.

In the last five years there has been a marked trend for whole school professional development programmes with the aim of creating a better school, i.e. improving teaching and learning in the school, and a rise in school league tables. Often in partnership with commercial providers, this PD does not lead to credits. This is markedly different from PD provided by universities which tends to be more traditional, off-site, and success is based on written papers. Universities are reluctant to go into schools to provide training, resulting in two types of PD: formal accredited off-site and practical non-credited on-site.

Portugal

Training is compulsory in some projects. MOOCs are a resource to reach a large number of teachers and for dissemination.

Slovenia

Teachers' professional development is linked to pay increase/ career progression. Teachers who attend seminars/professional development courses receive a certificate which includes points according to the duration of the seminar (8 hours = 0.5 points). When they submit an application for promotion, professional development courses are part of the criteria for selection. Teachers need a certain number of points from PDC for different levels of promotion: Teacher Mentor: 4 points - Teacher Advisor: 5 points - Teacher Expert: 7 points.

Spain

Training and professional development issued or certified by the education administration (national or regional) is taken into account for a pay increase review every six years. It is given if the teacher has completed a minimum of training hours or credits during that period of time. The minimum is not the same in all the regions. As far as promotion is concerned, training is valuable and helpful to get some jobs in the official administration, such as head teacher. On the other hand, for some other posts, training is not required though it may be taken into consideration.

United Kingdom - Scotland

In Scotland professional development (PD) is not linked either to pay or promotion. It is provided by a wide range of institutions and organisations as well as professional associations and teacher unions. A full range of types of PD is also available. PD is compulsory, as each teacher is contractually required to complete 35 hours' PD every year, but the nature of the PD is not specified, and can include MOOCs as well as face-to-face courses. Both face-to-face and online courses are reviewed for official approval.

Concluding remarks

In the 14 countries surveyed, professional development (PD) tends to be linked either to a salary increase or promotion, or both. There is a wide range of PD providers, most commonly universities, ministries, public bodies and commercial companies. Online PD exists in all countries although to a limited extent in some and face-to-face PD tends to take place in schools and to last one day or less. PD also tends to be compulsory, but is not in five countries. Where it is, it amounts to the equivalent of 18 to 35 hours a year typically, though can be as many as 12 days (in the Czech Republic). In some countries restrictions are placed on teachers' choice of CPD courses, while in others there is more flexibility and devolved choice to schools or teachers themselves. Online courses are compulsory in only three countries (France, Portugal and Scotland).

3: Certification

This chapter provides an overview of the models and practices in national teacher competence certification, based on the results of the online survey completed between November 2015 and May 2016 and of follow up Skype interviews carried out with each partner in April-May 2016.

Accreditation is covered in survey items 11 - 16, where respondents in all 14 countries surveyed describe approaches and strategies in their education system to recognize and validate teachers' professional training. The items consider different dimensions and approaches: the first focuses on the different types of accreditation provided for training (Q11 - What types of accreditation are provided for any type of training?), mapping possible options: certificate issued by the training provider, certificate validated by an official body (e.g. university), course credit, open badge, degree or higher level qualification or other (to fill in the blank). For each type, item Q12 asks if certification is based on online assessment of teachers (Q12- If, in some cases, certification is based on online assessment of teachers): how is the organization of examination and certification (e.g. closed quizzes, open answers, situated tests, simulations or online observation of examinees, also defined "proctored tests" Q12a); if the identification of the examinee is verified during the online test (Q12b); if there are open-ended tests (e.g. producing artefacts, lesson plans), how they are evaluated and by whom (peers, experts, tutors...) in the item Q12c. Respondents could also provide links to documents to provide additional information on national reports or other documentation (Q13 - Please provide a link to relevant documentation, studies, reports etc., in your language about teachers' professional development policy and certification, see in the country cards below). Item Q14 asks if courses are reviewed for official approval, and, if so which courses are formally approved (Q15), who approves courses (e.g. university, government, experts) (Q15a), who approves training providers (e.g. the awarding body, no one) (Q15b), and finally who monitors and evaluates courses (e.g. government, university, no one) (Q15c). If courses receive formal approval, item Q16 asks who assesses and certifies achievement, through a multiple choice question (the organisation assesses and certifies training, an external university, a commercial body, a regional centre, the course provider, other (with blank space).

Type of certification

Figure 6 shows the types of accreditation provided.

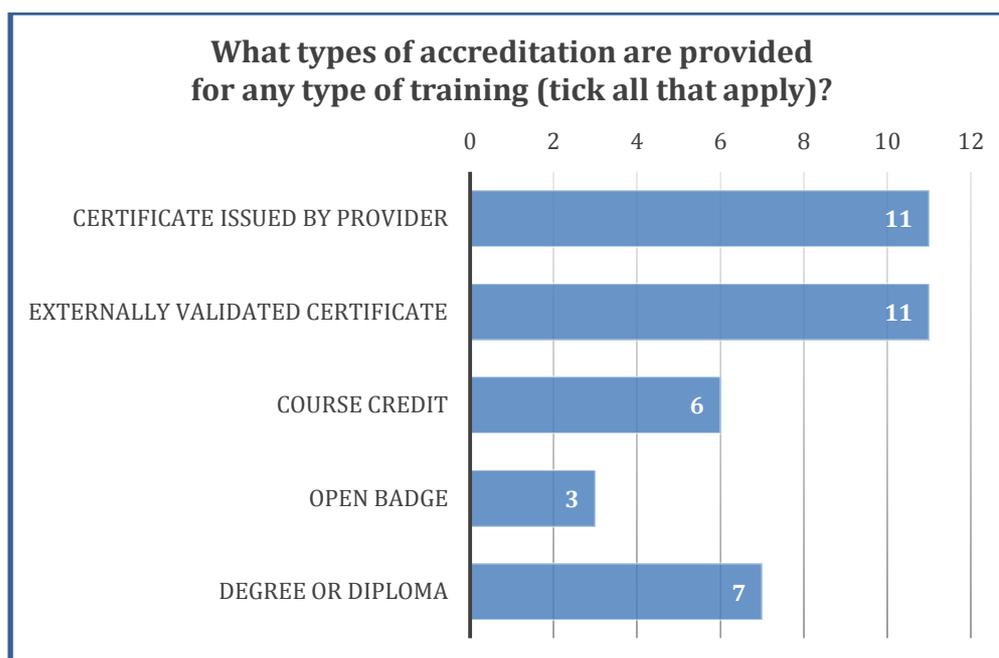


Figure 6: Types of accreditation are provided for any type of training

The options "Certificate issued by provider" and "Externally validated certificate" are the most frequent type (11 out of 14 countries), in fewer cases accreditation is through the achievement of a degree or diploma (7 countries); course credits (six countries) and three countries award Open Badges as a form of learning accreditation (Finland, Spain, Cyprus).

Online assessment

Item Q12 captures free text answers about the approach to online assessment of teachers, asking how assessment and certification is organized, how the identification of the examinee is verified during the online test and how open tests are evaluated and by whom.

France has online assessment (e.g. magistere.education.fr), but it is "more formative feedback on specific topics during the course and not at the end of the course (placement tests)," according to the respondent. The ministry of education "does not currently provide open badges or specific digital accreditation but these solutions are under discussion." In **Scotland** "accreditation of courses/programs takes place before it is offered", "criteria are set out in advance" and in "open-ended tests teachers are evaluated by a General Teaching Council of Scotland² panel who confirm a Professional

² <http://www.gtcs.org.uk/> is the web site of The General Teaching Council for Scotland (GTCS) was one of the first teaching councils in the world when it was set up in 1965. In 2012, legislation passed by the Scottish Parliament made it the world's first independent, self-regulating body for teaching.

GTCS is governed by a Council made up of 19 elected teachers, 11 nominees from stakeholder groups and seven appointed lay members. Council members serve for four years and

Recognition Award”; in **Norway** the online assessment of teachers is defined by the institution providing PD, while for **Czech Republic** “the form of assessment depends on course providers”. In **Italy** only the Induction PD is mandatory: in this case teachers use the web platform *Neoassunti* (new entry teachers) for their training, but the open-ended tests uploaded by teachers are evaluated offline by their tutors. In **Lithuania** assessment and certification are organised with “closed quizzes, open questions, assignments”, and the identification of the learner is carried out by the providers through an online system; the open-ended tests usually are marked by experts. In **Spain** “closed quizzes and tests are used, though the most common is the assessment of products and activities (didactic units, participation in forums, etc.)”, and “the examinee is identified in the training platforms with his/her username and password, which is necessary to access tests and activities”. “The most common is tutors assessing participants, though some activities are peer assessed.” In **Slovenia** assessment is through quizzes, but the most important part is based on production of videos and other materials. Authentic assessment online is being explored, asking teachers to perform tasks, work collaboratively. Assessment is through peer-assessment, checklists, video-conferencing; in the open-ended, test peer-assessment, self-assessment and the evaluation of external assessors (experts) are used. In the online environment the identification of the examinee during the test is also managed. In **Finland** it is “mainly qualitative outputs that are closely linked to the daily work of the teacher” that are evaluated (‘evaluated’ in a broad sense, i.e. informal, casual feedback taking place in the course of teachers’ daily work). Assessment is through peer and tutor feedback. Regarding the problem of identifying the users online during the tests, Finland says there is rarely a need for strict identity verification procedures because online tests/exams are rarely used (a blended approach is preferred), and formal feedback rarely takes place, except for university courses. Outputs are more often qualitative and informal; and “they are mainly evaluated qualitatively by tutors (and peers), often with a formative approach”, aimed at developing pedagogical competences.

Estonia, Greece, Cyprus, Denmark and Portugal did not respond to this question

Reviewing and accrediting courses and content

Figure 7 shows that in 11 of the 14 countries courses are reviewed for official approval.

election/reappointment processes take place every two years when half of the members step down. The Council sets GTCS policy.

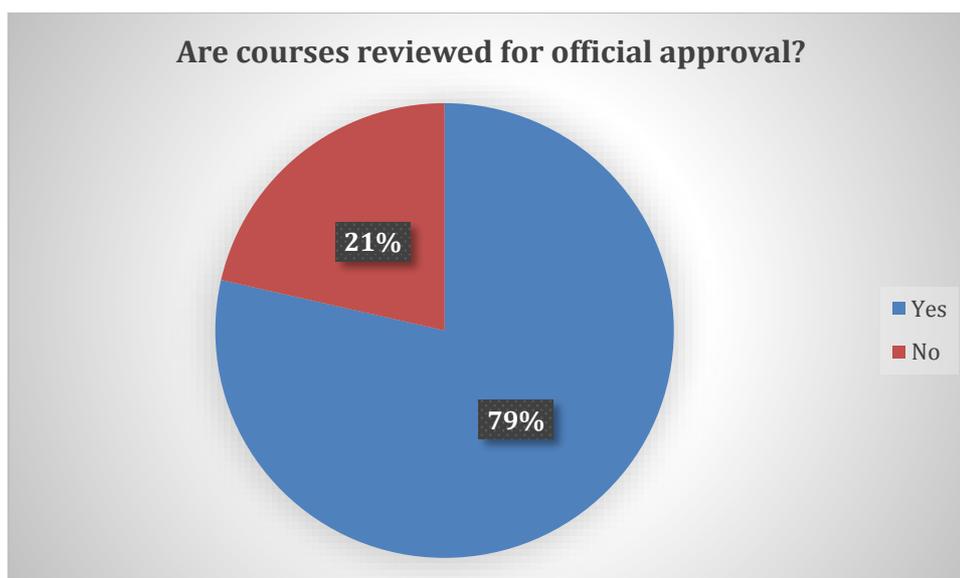


Figure 7: Are courses reviewed for official approval?

Figure 8 considers who assesses and certifies achievement (Item Q16). In six countries it is the course provider, in others universities and regional centres (three countries each).

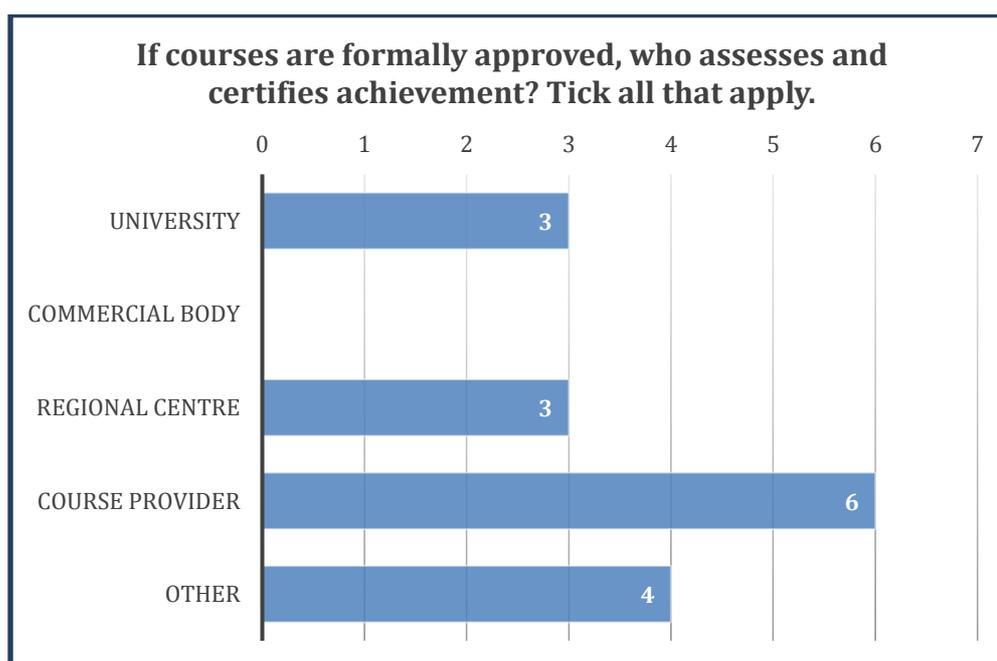


Figure 8: Organisations assessing and certifying training

It is interesting to see that no commercial organisations assess or certify achievement; none of the countries surveyed delegates this responsibility to a private entity, presumably on the grounds that teachers and their training and professional development are a public asset and investment to protect.

Item Q15 collects open answers about the roles and actions of stakeholders in the evaluation and certification processes, respectively considering: a) who approves courses, b) who approves training providers, c) who monitors and evaluates courses.

In **Scotland** courses are approved by panels usually comprising a GTCS officer, a head teacher or relevant peers and possibly university representatives. A GTCS officer approves training providers offered by other national bodies such as third party public bodies, universities and local authorities; GTC Scotland monitors and evaluates through its accreditation procedures. In **France**, the ministry of education, local authorities and universities (in charge of initial teacher education and providing a MOOC open to teachers from secondary and primary schools³;) are responsible for monitoring and formally approving courses or training providers. It is similar in **Estonia** where these tasks are the responsibility of the ministry of education, university and government, Spain and **Greece**, where, said the respondent, “depending on the specific course, approval may come from: a government body (primarily the Ministry of Education, its regional Educational Directorates and also, the organisations it supervises -like CTI), a university (for postgraduate degrees or other courses/seminars they offer), or, a body of experts. For the approval of training providers, “as a general rule, the awarding body. However, in some cases there is no approval”, while “depending on the specific course, monitoring and evaluation of the provided course may come from a government body or a university”. In the **Czech Republic** the Ministry of Education is also responsible for approving courses and training providers, in addition to monitoring and evaluating courses: “course providers can ask for accreditation given by Ministry of Education, Youth and Sports (MEYS)” and “Courses that obtained accreditation by MEYS are monitored by MEYS”. In **Cyprus** it is the Government that approves courses, because compulsory PD courses are offered by the Ministry itself through the Cyprus Pedagogical Institute, while the Cyprus Council for the Recognition of Higher Education Qualifications monitors and evaluates university programmes of study.

Centralised and public visibility of the approval system of courses for teachers' PD is found in **Lithuania, Slovenia and Portugal**. In **Lithuania** national courses and those taking place abroad are approved by the Education Development Centre; other courses (e.g., institutional) are approved by approved training providers, while Education Development Centre training providers approve training providers and monitor courses. **Slovenia** has a Programme Board nominated by the Ministry of Education which approves courses, while training providers are approved by the Minister of Education. Monitoring and evaluating are delegated to the Programme Board. In **Portugal** a “Government-supported independent body” approves courses and training providers, while “the quality of the courses is evaluated by consultants of the Teacher Training Center and monitored by the Government supported independent body that certifies the courses”.

³ Regarding Moocs on FUN - <https://www.fun-mooc.fr>

Italy splits the approach of accreditation for courses and training providers depending on the different steps of teachers' professional development and phases of their career:

- In the first step – Initial Teacher Education (compulsory phase) – teacher qualification courses are approved by ministry of education at first and then by universities;
- In the second step – induction (compulsory) – the ministry of education, in collaboration with regional ministry offices and INDIRE, provide training courses; INDIRE monitors online activities while regional ministry offices monitor face-to-face activities; and at the end the ministry is the final evaluator;
- Continuous professional development (not compulsory at present but strongly recommended in the law 107/2015) courses are approved by the ministry of education and training providers.

Respondents in Norway, Denmark and Finland skipped this question.

Country reports

This section comprises a description of the accreditation approach in each country.

Cyprus

Obligatory PD courses are offered by the Ministry of Education and Culture through the Pedagogical Institute; thus they are approved by the Ministry. The Ministry of Education also reviews proposed courses, monitors overall demand and decides which courses are needed – preferring general topics such as educational psychology and examination changes to subject-related courses (mathematics, physics etc.). Some programmes, for example the pre-service training programme, are offered by the Cyprus University after approval of a corresponding committee at the Ministry.

University courses are reviewed for approval by the University corresponding body, whereas the Cyprus Council for the Recognition of Higher Education Qualifications monitors and evaluates courses leading to higher degrees. Universities assess and certify training, for example diplomas are issued if a written examination is passed. As a minimum, most PD providers issue a certificate of attendance on completion of training. In some centralised training programmes, such as a training programme on ICT skills, certification is external (European Computer Driving Licence).

Type of accreditation: Certificate issued by the training provider, Certificate validated by an official body (e.g. university), Course credit, Degree or higher level qualification.

Formal approval Government, Cyprus Council for the Recognition of Higher Education Qualifications

Documentation:

www.kysats.ac.cy on higher education regulations and provision (in Greek).

Czech Republic

Although courses do not lead to direct salary increases or promotion, and there is no national credit system, some receive official approval from the Ministry of Education, Youth and Sports, in which case the ministry also monitors courses. Head teachers evaluate the achievement and impact of course on their staff and in turn their teaching. Head teachers' judgment is important: it is they who decide if a teacher can follow a course of training. Provider organisations also assess and certify training. Many teachers are self-motivated (especially in digital pedagogy) and are not concerned whether or not they receive certification by MEYS. However, a certificate issued by a training centre is welcome in order to include it in a teacher's portfolio and to present it to the head teacher.

Type of accreditation: Certificate issued by the training provider, Certificate validated by an official body (e.g. university); In some case certification is based on online assessment of teachers, but the form of assessment depends on course providers.

Online assessment: The form of assessment depends on course providers.

Formal approval: The courses are reviewed for official approval. Course providers can ask for accreditation given by Ministry of Education, Youth and Sports (MEYS). Courses that obtained accreditation by MEYS are monitored by MEYS.

Assessment and certification: university assesses and certifies training; as teachers' professional development is under the authority of head teacher, it is the head teacher who evaluates the achievement and impact of courses.

Documentation:

<http://www.msmt.cz/vzdelavani/dalsivzdelavani/akreditace-v-systemu-dvpp>

<http://www.csicr.cz/html/TALIS2013-NZ/flipviewerxpress.html>

Denmark

It is not a Danish tradition to have certificates and badges. Until recently many teachers tended to stay in the same school throughout their career. Under this system, teachers felt responsible as professionals for their own development and training, and took up training opportunities as they saw fit. Moreover, the head teacher knew the strengths and weaknesses of their staff and could suggest areas for professional development to the individual teacher. The head teacher would then know if the PD had taken place and if the teacher had developed their competence as a result of it, so certification was not necessary. There is now more mobility in the profession and teachers need to have documentary evidence that they have completed training and acquired competences when applying for posts in other schools. In consequence, teachers have begun asking for certificates on completion of training, to demonstrate that they have completed the course and have the required competences. Evidence often relates to the number of hours expected of participants and assignments completed. Evaluators read the assignments and sign their assessment report. Usually university colleges approve and certify courses.

Type of accreditation: Certificate issued by the training provider, certificate validated by an official body (e.g. university), degree or higher level qualification

Online assessment: Impossible to pinpoint only a few, varies.

Formal approval: PD courses are not formally approved

Documentation:

<https://www.eva.dk/projekter/2013/analyse-af-laerere-og-paedagogers-kompetenceudvikling>

Estonia

Type of accreditation: Certificate issued by the training provider, certificate validated by an official body (e.g. university);

Formal approval: Courses are reviewed for official approval by university and the Ministry of Education who both monitor and evaluate courses.

Assessment and certification: an external university assesses and certifies assessment, while a regional centre evaluates and certifies training processes.

Finland

Type of accreditation: Certificate issued by the training provider is the most common type of accreditation. Open badges are increasingly being used in ICT-related online/blended courses (e.g., programming). Other accreditation types mainly apply if a teacher decides to enrol in open university studies etc.

Online assessment: Mainly qualitative outputs that are closely linked to the daily work of the teacher. Assessment is in the form of peer and tutor feedback. There is rarely a need for strict identity verification procedures because online tests/exams requiring that are rarely used. Instead, the outputs are more often qualitative. They are mainly qualitatively evaluated by tutors (and peers), often with a formative approach.

Formal approval: No

Assessment and certification: No

Documentation:

<http://www.minedu.fi/export/sites/default/OPM/julkaisut/2015/liitteet/okm10.pdf>

<http://www.osaavaverme.fi/selvitysty-1/Raportti/ope-ei-saa-oppia-opettajankoulutuksen-jatkumon-kehittaminen>.

France

Type of accreditation: certificate issued by the training provider, certificate validated by an official body (e.g. ministry of education plus university regarding initial teachers);

Formal approval: Courses are reviewed for official approval by the French ministry of education and universities (in the case of MOOCs on FUN - <https://www.fun-mooc.fr>).

Training providers are approved by the ministry of education and local authorities monitor and evaluate courses.

Assessment and certification: an external university assesses and certifies assessment, while the ministry and local authorities evaluate and certify training processes.

Documentation:

<http://www.espe.education.fr/>
<http://eduscol.education.fr/pid23276/formation-des-enseignants.html>
<http://www.education.gouv.fr/cid86750/31-nouveaux-parcours-de-formation-m@gisterepour-les-ecoles-superieures-du-professorat-et-de-l-education.html>

Greece

Type of accreditation: Courses are reviewed for official approval, and the Institutions who approve the courses are various and at different levels; depending on the specific course, approval may come from: a government body (primarily the Ministry of Education, its regional Educational Directorates and also, the organisations it supervises -like CTI), a university (for postgraduate degrees or other courses/seminars they offer), or, a body of experts.

Formal approval: As a general rule, it is the awarding body. However, in some cases there is no approval.

Assessment and certification: Depending on the specific course, monitoring and evaluation of the course may come from a government body or a university. This organisation assesses and certifies training.

Documentation:

http://www.oepek.gr/pdfs/meletes/oepek_meleth_04.doc
http://www.oepek.gr/pdfs/meletes/oepek_meleth_05.pdf

Hellenic Organisation for Teachers' Training:

http://www.oepek.gr/portal/index.php?option=com_content&view=article&id=118&Itemid=108

Italy

Type of accreditation: Italy divides teacher training into different phases, with different levels of accreditation:

- 1) Induction: at the end of the training year the school principal and the school evaluation committee give approval to the teacher;
- 2) PD: training is accredited by each training provider according to its methods (certificate for training providers, degree or course credit for University). All the providers must be approved by the ministry of education.

Online assessment: In the induction PD (the only one mandatory), teachers use the web platform Neoassunti for their training but there is no pure online assessment: in fact teachers upload their content (e.g. didactic activities reports, portfolio) and fill in the self-assessment form in the online platform, but their digital artefacts are evaluated offline by their tutor and by the School Evaluation Committee. Identification of the teacher in the online environment Neoassunti is provided by teachers providing their ID card number and tax identification number. Personal data are cross-checked with school data in which the teacher is registered. Open-ended tests uploaded by teachers are evaluated off line by their tutors.

Formal approval: Courses are reviewed for official approval, in different steps:

- Initial Teacher Education (compulsory phase): teacher qualification courses are approved by the ministry of education at first and then by universities;
- Induction (compulsory): the ministry in collaboration with Regional ministry offices and INDIRE provide training courses; INDIRE monitors online activities while regional ministry offices monitor face to face courses. Ultimately the ministry of education is the final evaluator of the course.
- PD(not compulsory at now but strongly recommended): courses are approved by both the ministry and training providers.

Assessment and certification:

- Induction phase (compulsory): there is a School Evaluation Committee for each school, with different members (local officer of the ministry of education, school members, teachers and parents) with the aim to attest the achievement of newly qualified teachers
- PD (not compulsory): the training offer is open, each course provider has their own means of assessment and certification

Documentation:

<https://labuonascuola.gov.it/>

http://www.istruzione.it/scuola_digitale/allegati/Materiali/pnsd-layout-30.10-WEB.pdf

http://www.INDIRE.it/wpcontent/uploads/2015/11/R10_bilancio.pdf

Lithuania

Type of accreditation: Certificate issued by the training provider. Most universities have approved procedures for validation of prior learning, non-formal or informal learning outcomes.

Online assessment: closed quizzes, open questions, assignments. Accounts are provided by the on-line system. Open-ended tests are usually evaluated by experts. Formal approval is via the National Body. Courses undertaken abroad are approved by the Education Development Centre, while other courses (e.g. institutional) are approved by official training providers.

Assessment and certification: the Education Development Centre approves training providers and training providers and monitors and evaluates courses. An external university assesses training courses; the ministry and local authorities certify training providers.

Documentation

<https://www.etar.lt/portal/lt/legalAct/7f45d9f02f7911e4a83cb4f588d2ac1a2>

http://www3.lrs.lt/pls/inter3/dokpaieska.showdoc_l?p_id=302571&p_query=D%EBI%20reikalavim3

https://www.smm.lt/uploads/lawacts/docs/575_2e542b56374b59db1243003bccab175f.pdf

Norway

Type of accreditation: All types of certifications: by provider, by externally validated

certificate, course credit, degree or diploma.

Online assessment: This is defined by the institution providing PCP.

Formal approval: Courses are not reviewed for official approval.

Assessment and certification: Teachers tend to develop their digital competence on their own, exploring tools and products in their own time. A digital tool for self-assessment was introduced: Teacher Mentor. It was used by 1,000 of the 90,000 Norwegian teachers before it was closed down in January 2016. There is a growing gap between schools in the use of ICT, some well ahead of others. These schools make use of CPD provided by the commercial supplier of products and services used in the school, covering both the technology and its pedagogical use. A number of schools have a preferred dealer who provides an 'all-in-one' managed out-sourced service including the supply and maintenance of tablets and cloud services. Given Norwegian teachers' personal commitment to developing their competence, there is little interest in badges and similar incentives. Moreover, there is union opposition to this form of recognition, seeing them as a threat to the professionalism of teachers. A paper certificate with their name and a description of the course content often suffices, together with formally recognized credits where available. There is some online training in Norway, in particular a MOOC running from September 2015 to June 2016 for teachers of mathematics. They work collaboratively on end of unit papers but the final assessment is based on an assignment produced individually at home with access to all resources, submitted on paper and assessed by experts or university staff who grade it and award credits. Norwegian teachers wishing to develop their digital competence do so mostly by exploring digital resources on their own. Increasingly schools implement school-based PD provided by commercial providers.

Documentation

<https://www.regjeringen.no/en/topics/education/innsikt/larerloftet/id2008159/>

<http://www.udir.no/videreutdanning>

https://iktsenteret.no/sites/iktsenteret.no/files/attachments/nulrapport_english.pdf

Portugal

Type of accreditation: Certification is issued by a training provider, as a course credit. In some cases it is the ministry of education that grants approval.

Formal approval: Courses are reviewed for official approval.

Assessment and certification: This is by a government supported independent body. The quality of the courses is evaluated by consultants of the Teacher Training Center and monitored by the government supported independent body that certifies the courses. This organisation assesses and certifies training

Documentation:

<http://www.ccpfc.uminho.pt/Default.aspx>

Slovenia

Type of accreditation: Certificate issued by the training provider. Certificate validated by an official body (e.g. university).

Online assessment: quizzes, producing videos, materials, performing tasks, collaborative work, peer-assessment, checklists, videoconferencing ...; Verification: digital identity in a virtual learning environment. Open ended tests are assessed by: peer-assessment, self-assessment and assessor (an expert).

Formal approval: Courses and training providers are approved by a Programme Board nominated by the Ministry of Education.

Assessment and certification: The course provider assesses and certifies training
Documentation:

Policy regulations: <https://www.uradni-list.si/1/content?id=37063>

Reports and studies:

http://www.pei.si/UserFilesUpload/Porocilo_ES%20Prof%20razvoj%20strok%20del%20v%20poklic%20in%20strok%20izob_DOPOL

Spain

Type of accreditation: Certificate issued by the training provider, certificate validated by an official body (e.g. university), course credit, open badge, degree or higher level qualification.

Online assessment: Closed quizzes and tests are used, though the most common is the assessment of products and activities (didactic units, participation in forums, etc.); The examinee is identified in the training platforms with his/her username and password, which is necessary to access tests and activities; The most common is tutors assessing participants though some activities are peer assessed.

Formal approval: universities, universities and government, government.

Assessment and certification: Regional centres and course providers assess and certify training.

Documentation:

<http://www.boe.es/boe/dias/2011/10/28/pdfs/BOE-A-2011-16923.pdf>

United Kingdom - Scotland

Accreditation is provided and validated, and can include course credits and degrees. The General Teaching Council of Scotland (GTCS) makes available professional recognition awards for those courses it has accredited and is developing a scheme of accreditation based on open badges. There is no formal structure in place. Some accreditation will be provided for simple completion of a course. Longer-term courses (perhaps held on single days over a few weeks or months) will involve more formal assessment, most often by a tutor. Evidence will depend on the depth of the course could include any usual sources. Validation in the more in-depth courses is undertaken by the course tutor. Certification most often is a simple certificate. In the case of online courses, a GTCS panel approves courses and confirms Professional Recognition Award⁴. The panel typically comprises a GTCS officer, a head teacher or other relevant peer and possibly a university

⁴ See <http://www.gtcs.org.uk/professional-update/research-practitioner-enquiry/professional-recognition/professional-recognition.aspx>

representative. The providers of such courses are approved by other national public bodies, universities and local authorities. Courses are monitored and evaluated by GTCS through its accreditation procedures.

Type of accreditation: by provider, by externally validated certificate, course credit, degree or diploma, GTC Scotland makes available Professional Recognition Awards for those courses it has accredited.

Online assessment: Criteria are set out in advance and a GTCS panel confirms Professional Recognition Award.

Formal approval: Yes

Assessment and certification: This is through a panel usually comprising a GTCS officer, head teacher or relevant peer and possibly a university representative. It is provided by other national bodies such as third party public bodies, universities and local authorities; GTC Scotland through its accreditation procedures.

Documentation:

<http://www.gtcs.org.uk/professional-update/research-practitioner-enquiry/professional-recognition/professional-recognition.aspx>

Concluding remarks

In almost all countries, courses are reviewed for official approval. The typical accreditation provided for teacher training is a certificate issued by the training provider, validated by an official body. Courses are formally approved by government, university or an official body, and an external university or MoE (or a MoE regional centre) assesses and certifies achievement. There appears to be a widespread centralised view among the countries surveyed regarding the accreditation and certification of courses for the professional training of teachers. Commercial bodies do not play a role in approving, monitoring, assessing or certifying achievement or courses. There are closed and quantitative approaches as well as open and qualitative approaches, but no evidence of proctoring during online observation of examinees. Teacher assessment online is based on closed tests, situated tests, simulations and open-ended answers. If there are open-ended tests (production of artefacts, lesson plans, etc.), learners are evaluated by experts (tutor, senior teacher) in most cases. No country has a system to verify the identification of the examinee during the test, and if a country said they had, they didn't specify how in practice, e.g. proving one's identity in a virtual learning environment. No countries currently use intelligent agents or other automatic assessment approaches and in only four are there forms of peer assessment: Scotland, Slovenia, Finland (where it takes the form of peer feedback) and Spain.

4: Developing and assessing teachers' digital competence

This chapter provides an overview of how digital competences are developed, assessed and certificated in each country participating in the MENTEP survey, based on responses to questions 17-19. At the end of the chapter, some issues and examples are highlighted in order to have insights and suggestions for a MENTEP model related to teachers' development of digital competences and their assessment and certification.

Country reports

In the following paragraphs a description of the digital competence situation for each country is presented.

Cyprus

Teachers develop their digital competence through non-compulsory courses and seminars ranging from the European Computer Driving Licence to application-specific training (e.g. Photoshop, Logo) and use of ICT in the learning process (e.g. ePortfolio, interactive whiteboards). In 2004-2009, a centralised programme was offered to all teachers at all levels on ICT skills (lasting 50-70 hours): primary education teachers were certified through the European Computer Driving Licence and secondary education teachers through a project evaluated by the instructor (due to Ministry-unions agreements). Since 2010, PD in digital competence is provided through school-based training and yearly programmes such as The Innovative School programme and the coaches for the use of ICT in the learning programmes. Participation in the programme is voluntary and the schools chosen (about 20 every year) are supported through the year by the CPI, and are certified based on the requirements of the programme (<http://ksep.e-epimorfosi.ac.cy>). This training is not part of the January two-day PD unless requested by schools. Cisco Systems are active in Cyprus and provide vocationally-related courses in the Networking Academy. Online PD in specific subjects or topics is only just beginning in Cyprus and teachers are not yet familiar with it; they will need to get used to how they work and expectations of participants. Courses in English would not be a barrier, particularly for younger teachers.

Czech Republic

Teachers' digital competence in the Czech Republic is mentioned in a 2014 strategic document *Strategie digitálního vzdělávání do roku 2020* (Digital Education Strategy until 2020). The objective of this strategy is to put in place an education system that will support everyone alike with competencies that enable them to find their place in the information society and to take advantage of open education opportunities throughout their lives. Success in implementation is dependent on the support of teachers; therefore it contains plans for further teacher training in this area. The

Strategy can be considered as a framework defining basic priorities and directions of intervention, with specific measures to be further elaborated.

Teachers can take part in different digital competence training courses offered by universities, businesses and non-profit organizations, some of them free of charge. Important initiatives include operational programmes funded from the European Social Fund, because some directly focus on teacher training in the field of ICT and on the purchase of ICT equipment for schools, especially Call 51. Within this call, each of the 2,000 supported elementary and secondary schools was able to purchase up to 20 mobile touch devices (mostly tablets). The project also included training for teachers in how to work with tablets.

According to the annual survey by the Czech School Inspectorate, ICT was one of the most frequently mentioned subjects of PD undertaken by teachers in the 2014-2015 school year. Teachers also feel the need for further training in this field. If the head teacher is positive about the use of technology then staff development and support is provided, particularly if the school receives interactive whiteboards or tablet computers, as is happening in 2016. Conversely a head teacher not interested in the benefits of ICT can have a strong inhibiting effect on the uptake of digital technology and giving teachers' opportunities to develop their competence in using it effectively.

Further reading:

http://www.vzdelavani2020.cz/images_obsah/dokumenty/strategie/digistrategie.pdf

<http://www.csicr.cz/html/VZ2014-15v2/flipviewerexpress.html>

Denmark

There are big differences from teacher to teacher, school to school, and municipality to municipality. Digital competence of teachers is not considered separately from subject teaching competence. Therefore digital competence is integrated into training for Danish language, mathematics etc. ICT in subjects is still a challenge for many teachers. A major change comes into effect in 2020 when teachers in primary and lower secondary schools may teach only subjects they are demonstrably competent to teach. Until recently many teachers tended to stay in the same school throughout their career. Under this system, teachers felt responsible as professionals for their own development and training, and took up training opportunities as they saw fit.

Estonia

In Estonia webinars, MOOCs and online courses are used for the professional development of teachers, together with face to face events. Many of these courses are assessed online, through tests and portfolios. At present under construction is a national digital framework for evaluating digital competences, developed by HITSA, the National Center for Innovation. The assessment rubric of this tool, based on the ISTE, is available as a downloadable pdf document

(<http://www.innovatsioonikeskus.ee/sites/default/files/ISTE/HT%20hindamismudel%202014%2C%20HITSA.pdf>). Currently, it has just gone through a more in-depth validation which included wider testing of the rubric by the teachers and subsequent focus group interviews. After the results of this validation are analysed in June 2016, a decision will be taken whether to continue with that approach and develop an online tool to support it.

The framework of the evaluation model comprises five main categories:

- Encouraging learners and developing their creativity (ISTE 1.)
- Developing teaching and assessment methods suitable for the digital age (ISTE 2.)
- Teacher as a role model in the working and learning culture of the digital age (ISTE 3.)
- Being a citizen in the digital society (ISTE 4.)
- Professional development and initiative (ISTE 5.)

The framework is cumulative: each level builds on previous ones: in order to complete the third level, one needs to have fulfilled the requirements of the first and second levels. The first level describes the lowest level of the skill and the fifth level is the expert level. The goal is not to attain expert levels in all areas, but to be able to assess one's competences. Knowing that she is at a level 2 skill helps the teacher to understand what kind of training to choose and how to pursue her development. If a teacher is not able to assess some of their skills, the skill is left unassessed.

Currently, portfolios are implemented within the 'Teacher of the Future' training programme (<http://tulevikuopetaja.hitsa.ee/koolitusprogrammist/>). These are mainly used for reflection and evidence collection. The list is accessible here: https://docs.google.com/spreadsheets/d/1bjHemvwOMybW5LVjXZ3kVvj3kLcykODFkFZCCxeln_Q/edit#gid=0. Not all portfolios are accessible without permission. Even though these are visible to all participants of the training programme, the portfolios are evaluated and the feedback is given only by the instructors, i.e. there is no peer-assessment component included yet.

Finland

In Finland, the Collective Agreement for Teachers specifies that teachers should spend three days a year on PD and planning. However, there is no restriction as regards the type or topic of PD; it depends on the municipality or school, what is considered eligible.

The project "New Learning Environments and Digital Materials to Comprehensive School" has been specified as one of the key areas in the implementation of the Government Programme. In order to be able to implement the "digital leap" in schools, increasing demands are being placed on teachers in terms of digital competence. Therefore, the improvement of teachers' digital competence is a very topical issue in

Finland.

There is an online self-assessment tool, OPEKA, that is widely used in municipalities across the country. It is not used for official certification but it provides teachers with a personal ICT competence profile, and schools and municipalities with a general overview of the ICT competences of their teachers.

So far there is no general certification system on the national level for teachers' professional development in digital competence. However, due to the aforementioned demands, it is currently a matter of discussion whether there should be one. The issue has been highlighted e.g. in the recent report published by the Trade Union of Education, outlining a set of recommendations for improving teachers' and school leaders' digital competence, in Finnish (<http://www.oaj.fi/cs/oaj/OAJn%20askelmerkit%20digiloikkaan?resolvetemplatefordvice=true&contentID=1408913244375>). According to this research, ISCED1 and ISCED2 teachers have typically engaged in ICT-related professional development for at most one day per year.

Approaches to training for teachers include:

- Specific training days that are thematically focused on digital tools (often included in the number of compulsory PD days);
- Long-term (e.g. several years) municipality- or region-wide projects, often funded by the government, where different forms of training are organized and new practices are experimented with in schools;
- Continuous peer training/mentoring within a school or between different schools in a municipality (e.g., as a way of sustaining aforementioned projects after the project lifetime);
- National or regional events/seminars where teachers can try new products, watch demos, and listen to presentations about good practices;
- Online/blended courses (organized by universities, commercial providers, etc.).

The extent to which teachers develop their digital competences depends to a great degree on the municipality and the school in which they work, as well as on their personal commitment to learning about the use of digital tools. Assessment is often carried out online, mainly through qualitative outputs that are closely linked to the daily work of the teacher. Assessment is in the form of peer and tutor feedback.

France

In France, only courses related to new or updated curricula or new educational laws are compulsory. As part of their continuing education, teachers can choose interdisciplinary courses, usually independent or peer learning courses. There are several online sources of information and training aimed at teachers, in particular:

- **Education.gouv.fr portal**, the official site of the Ministry of Education, where all school stakeholders (students, teachers, parents) can find news, examples fo

practice and information.

- **Eduscol**, a dynamic repository of all types of pedagogical materials for teachers. Contents are organized by issues (e.g. special needs, ICT) and by disciplines
- **M@gistere**, the online platform for training teachers, through MOOCs, content and communities.

New teachers are expected to obtain the C2i2e certificate ('certificat informatique et internet de l'enseignement supérieur de niveau 2 enseignant' <https://c2i.enseignementsup-recherche.gouv.fr/>), attesting professional competence in digital and online pedagogy. C2i level 1 is between levels 5 and 6 of the European Qualifications Framework and level 2 relates to specific professional competences. For teachers, there are several subareas of competence (<http://www.education.gouv.fr/cid54844/esrs1000461a.html>):

a. Digital competences for the profession

1. Digital working environments
2. Lifelong learning competences
3. Professional responsibility in education

b. Integration of digital competences in teaching

1. Competences for the integration of ICT into the didactic practices
2. Collaborative work
3. Project and production of didactical content in learning situations
4. Pedagogical practices
5. Evaluation practices

Assessment of digital competences (and other competences) is online. Further information about the examination can be found here:

- <https://c2i.enseignementsup-recherche.gouv.fr/>
- <http://www.education.gouv.fr/cid54844/esrs1000461a.html>

Online assessment of digital competence is through a **dossier numérique de compétences (DNC, a digital competence portfolio)** which collects outstanding situations experimented in classroom. The products and output of the DNC are assessed by a dedicated trainer (from an École Supérieure du Professorat et de l'Éducation, regional teacher education centres). The dossier contains evidence related to knowledge, attitudes and competences, for example:

- Artefacts resulting from the activities proposed during the studies
- Test results
- Commented external productions resulting from extra-curricular activities
- Blogs
- E-portfolios

More information can be seen here:

<https://c2i.enseignementsup-recherche.gouv.fr/enseignant/comment-evaluer-les->

competences

Greece

In Greece, opportunities for teachers to develop their digital competences include self-learning, regional seminars (online, face-to-face, and blended) organized by school advisers/counsellors, and national training programmes on the exploitation of ICT in educational practice. ICT training offers are accredited by school advisers/counsellors and assessment ranges from no assessment at all to a formal examination.

The national training programme is at 'B-level', and follows earlier training programme at 'A-level' ten years previously. A-level covered basic computer operation (ECDL), whereas B-level is more advanced and covers the use of ICT in teaching and learning. It is based on other frameworks but much of the content has been developed in Greece, from scratch. Course content is approved by a committee of university experts. A more advanced 'C-level' is under discussion, to cover communities of practice, mentoring and further use in teaching and learning. Teachers are expected to already have passed the A-level course before embarking on B-level digital competence training. This is assessed on the basis of attendance and project work plus a final formal examination.

The examination includes an personalised online multiple-choice questionnaire with 36 items drawn from a bank of 1,000 and a final written assignment consisting of an essay of some ten pages that describes in detail a learning activity using ICT. They are assessed by members of a panel of 50 paid experts randomly allocated. Those who succeed received a certificate with an official seal, which indicates that a certain number of points have been accumulated. So far 5,000 teachers of the 150,000 in Greece have followed this course.

Italy

Teachers' digital competences have been developed in recent years through large-scale training based mostly on online courses (Digital School and Interactive Dashboard until the 2013; PON Didatec until 2014; Technologies for didactic, FORTIC). More recently the law 107/2015 (called "La Buona Scuola") provides for a specific National Digital School Plan (http://www.istruzione.it/scuola_digitale/allegati/Materiali/pnsd-layout-30.10-WEB.pdf) which aims to develop digital competence in schools through developing the digital infrastructure and training.

The most important initiatives in this plan are training for new teachers (one of the training modules is related to 'new digital resources and their impact on learning') and courses provided by the schools with their own funds. The Digital School Plan also provides schools with funding for training 'digital animators', teachers who, according to the school's development plan, animate the professional community, managing digital activities, creating projects and training peers. From 2015 each school has 1000 euros each year for supporting the activities of the digital animator.

For privately-run courses (e.g. ECDL), the 107/2015 law provides teachers with a 500 euro bonus each year for improving their cultural background and professional development. It is not compulsory to spend the money on training; they can spend it on general cultural activities, but it is possible that part of it will be spent on buying personal digital equipment and on training.

Assessment of digital competences acquired depends on the aim of the course. In courses for newly qualified teachers there is a formal examination based on the evaluation of the work during the year. Assessment of Continuous Professional Development is usually based on formal examinations and/or tests, and the assessment of digital animators is carried out by the School Evaluation Committee and by the school head, based on evaluation of their CV (résumé).

Training for teachers in their first year is the only training that is mandatory and teachers use the Neoassunti platform (<http://neoassunti2016dev.INDIRE.it/>) for their training. On this platform there is no purely online assessment; instead teachers upload content (e.g. digital artefacts, didactic activities reports, portfolio) and fill in a self-assessment form. Both are then evaluated off line by the School Evaluation Committee, comprising a tutor, the school principal and other teachers.

Lithuania

Teachers' digital competence development is under discussion and improvements in the system will be introduced in the near future. The Ministry of Education and Science has prepared 'Requirements for Teachers' Computer Literacy Programmes' that develop teachers' professional competencies (approved by the Minister of Education and Science in March 2007). It is planned to renew requirements and procedures in 2016.

According to the requirements, teachers seeking to develop ICT competencies should develop:

- The basics of technological literacy, over 40 academic hours, final assessment carried out by tests;
- Educational ICT application competence consisting of two components, lasting in total at least 40 hours:
 - Educational ability to individualize subject content, reasonably use computer tools, reasonably apply teaching and learning methods
 - Management skills: ICT use to develop planning skills, manage ICT resources, and evaluate and reflect on ICT usage.

Training takes place in virtual learning environments, applying the e-portfolio methodology. Teachers work mainly in virtual environments and upload their work to the environment. The online portfolio used is Mahara and there is also a national information system (<https://www.aikos.smm.lt/Puslapiai/Pradinis.aspx>), which enables

teachers to develop and share an online portfolio.

Teachers educational ICT competences are assessed at three levels, according to different methods: the technological part is assessed by tests and the educational part by each teacher presenting digital assignments (lesson plans, scenarios, project, digital learning objects etc.) for assessment. Assessment is carried out online. Open-ended tests are usually evaluated by course experts and/or moderators. The product is typically reviewed by one expert, usually the course leader. Experts are usually teachers, people from universities or high schools with a certain level of expertise in the field. There are certain criteria for qualification, depending on the course. If they comply with these requirements they can be taken aboard after presenting proofs (certificates, cv, courses attended).

Norway

Teachers tend to develop their digital competence on their own, exploring tools and products in their own time. Increasingly schools implement school-based CPD provided by commercial providers. Teacher Mentor, a digital self-assessment tool was introduced and used by 1,000 of the 90,000 Norwegian teachers before it was closed down in January 2016.

There is a growing gap between schools in the use of ICT, some well ahead of others. Those leading the way take up PD provided by the commercial supplier of products and services used in the school, covering both the technology and its pedagogical use. A number of schools have a preferred dealer who provides an 'all-in-one' managed out-sourced service including the supply and maintenance of tablets and cloud services.

Given Norwegian teachers' personal commitment to developing their competence, there is little interest in badges and similar incentives. Moreover, there is union opposition to this form of recognition, seeing them as a threat to the professionalism of teachers. A paper certificate with the teacher's name and a description of the course content often suffices, together with formally recognized credits where available.

There is some online training in Norway, in particular a MOOC running from September 2015 to June 2016 for teachers of mathematics. They work collaboratively on end of unit papers but the final assessment is based on an assignment produced individually at home with access to all resources, submitted on paper and assessed by experts or university staff who grade it and award credits.

Portugal

The development of digital skills is not compulsory, but most teachers develop digital resources to use in their teaching and there is a growing demand for PD.

There is no standard level of digital competence required for teachers. Certification (not

only of digital competence) consists of diplomas for certified courses provided by training centres and is usually based on the number of hours of each training course. Each training centre is approved by the National Pedagogical Council of Professional Development. An online tool was developed in 2007 comprising three levels and is used for certification.

There are some MOOCs for supporting teacher training, they are considered a resource to reach a great number of teachers and for dissemination. In these MOOCs teachers are assessed through peer reviews and automatic correction tests. At the end of the training teachers take a certificate.

Slovenia

A specific framework for developing teachers' digital competences is based on six key e-competencies:

- C1 Knowledge and awareness of ICT, critical use;
- C2 Communication and on-line collaboration;
- C3 Search, select, process, and evaluate data, information and concepts;
- C4 Safe use of the web, ethical and legal use of information;
- C5 Design, produce, publish, adapt materials;
- C6 Plan, perform, evaluate learning and teaching by using ICT.

It is described in the following document:

http://portal.sio.si/fileadmin/dokumenti/bilteni/E-solstvo_BILTEN_ANG_2012_screen.pdf

Several platforms (Moodle, Adobe Connect, Mahara, web page, social media) are used for offering different forms of training:

- A virtual learning environment (Moodle) which assesses teachers' knowledge of the key e-competences (using the model of six e-competences);
- Webinars (shorter training) which cover specific content (lasting from one to four hours);
- Seminars (face-to-face and blended) in which teachers are trained on one of the six e-competences (lasting 16 or 24 hours, 44 seminars);
- Workshops (face to face) where teachers are trained in using specific content (with or without ICT) (4 hours)

In recent years training activities have been concentrated into two months (October-November) through the education action 'ABC e-school'. It offers different forms of training: seminars, workshops, online self-checks. Before teachers being digital competence PD they have to take part in a seminar on Collaboration in the On-line Learning Environment. The aim of the seminar is to establish both live and distance collaboration. Using a wide range of tasks, teachers collaborate, communicate and learn about personal data safety in the virtual environment.

Online assessment is based on several types of tests, both quantitative and, usually, qualitative. Qualitative tests include producing videos, materials, performing tasks, collaborative work, peer-assessment, checklists, videoconferencing. The type of assessment varies from seminar to seminar (e.g. role-play, lesson observation, questionnaire) and the final evaluation is carried out by peer-assessment, self-assessment and also by expert assessors. A Learning diary, prepared and shared in accordance with instructions, is essential for the completion of the seminar. In this learning diary different types of activities are evaluated differently according to the level of complexity of the task.

Finally, teachers' competences are certified through an e-card. The e-card enables them to systematically follow the progress they make while attending the training seminars focusing on the six competencies.

Spain

In Spain there is no official accreditation of teacher digital competence, though the official educational administrations offer specific training (face-to-face, online and blended) related to different aspects of competences or participation in innovation projects and plans also offered by educational administrations.

It is also possible to participate in training and PD offered by universities, unions and private entities, which can be recognized by the official administration.

At the present MOOCs are the main framework for training in digital competences: they are used by some 2,000 teachers each year. Recently a new model of MOOC, called NOOC (Nano Massive Online Course) has emerged, based on units of three hours of work and mainly task-oriented. In these MOOCs users can achieve a badge which keeps a detailed trace of the acquired competences.

Competences acquired through the MOOCs are evaluated through self-assessment, biography and evidence. Evidence, which is the part of the external evaluation, is evaluated through peer reviewing: each teacher assesses three colleagues and is in turn evaluated by three peers. At present there are no formal systems to moderate, verify or compare peer evaluation. However, a common rubric helps the peers to follow standard criteria for evaluation, and digital constraints in the platform ensure all teachers follow the same steps in the evaluation. Each year the best artefacts are highlighted in the platform.

UK - Scotland

Teachers develop their digital competence through very varied means. Some courses are arranged in-school while others are provided by subject networks, local authorities or specific CPD bodies such as the Scottish Schools Education Research Centre.

Concluding remarks

Digital competences are on the training agenda of all the countries surveyed. Some countries (France, Slovenia, Spain, Italy, Estonia) include digital platforms for training teachers in digital competences.

MOOCs are an emerging model of training in digital competence in some countries, as a way to reach a large amount of teachers at the same time. Some countries are also experimenting with a different version of this format: NOOCs, which are extremely focused short courses. The outcomes in these environments are often assessed through a peer-to-peer process (Spain, Portugal).

Other countries (France, Italy) have dedicated platforms for training teachers in their first year of teaching (induction); in these cases, evaluation is by experts or experienced teachers at school, who evaluate also the online products and artefacts.

Assessment of teachers' digital competence tends to be qualitative rather than quantitative (e.g. closed tests). In some cases, France and Spain for example, these are mainly based on portfolios and diaries for reporting activity. In other cases, as in Slovenia, there is also real-time assessment based on observation of work in class and of collaborative work online. In countries in which there is online assessment, it is often accompanied by authentic assessment based on real situations.

In some cases, for example induction in France and Italy, authentic assessment is performed by experts who are part of the school context and who also evaluate work in classroom during the year.

Specific rubrics are considered useful for the comparability of qualitative assessment among both candidates and assessors; Slovenia, Spain, Estonia for example, use them. Rubrics may combine done/not done criteria (useful for measuring the presence of specific behaviours which are indicative of digital competences), points and ratings which give different weights to different behaviours. Qualitative criteria are based entirely on the subjective evaluation of assessors.

External assessment can be accompanied by self-assessment activities (Spain, Italy), in order to situate competence development within a responsible and self-reflexive attitude among teachers and thereby not threaten their professionalism. In countries such as Norway or Denmark, there can be scepticism about external assessment, perceived as a formal or intrusive practice not linked to a personal attitude or aim. Rarely at present is there a digital certificate for competences achieved, but in Spain, Finland and Cyprus, Open Badges are used, and Slovenia uses an e-card, which profiles teachers' progress in competence development.

5: International certification instruments in education: a critical review

There is a considerable number of models and instruments for the certification of digital competence. In this chapter we consider some of these certification models and identify the major issues and trends to be taken in account in the design of a new certification model. A number of reviews of digital competence frameworks and certification published in recent years are mentioned, but this overview does not aim to be systematic or exhaustive. In highlighting a small number of studies we focus on those concerned with teachers' digital competence and with major issues related to assessment. The papers mentioned in the following paragraphs serve as a theoretical background to identify key concepts for an analysis of existing certification models in a critical perspective.

Theoretical background

European Schoolnet (EUN) has been working on the topic since the creation of the *Digital Competence working group* in (2009). In 2010 EUN published the *Digital Skills Working Group Review of National Curricula and Assessing Digital Competence for Students and Teachers: Findings from 7 countries* (Balanskat, 2010) as an outcome of the group. The review, based on the results of a questionnaire and five case studies, points out that the definition of digital competence is evolving from purely functional use of ICT to a concept of digital participation. This evolution is reflected in most of the national curricula that focus on *the confident and critical use of Information Society Technology* (EC, 2007): a complex behaviour that is underpinned by basic ICT skills, but is completed by knowledge from different domains (such as media studies) and attitudes.

The work of Ferrari (2012) for the DIGCOMP project⁵ covers the definition and assessment of digital competence. Ferrari's review aimed to identify, select and analyse current frameworks for the development of digital competence through the analysis of 15 examples drawn from school curricula, implementation initiatives, certification schemes and academic papers. Ferrari's work confirms the definition of digital competence as a work-in-progress that evolves according to rapid changes in technology and the presence of multiple domains that contribute to define the knowledge required to digital competent individuals.

Digital Competence is at the convergence of multiple fields. Being digitally competent today implies the ability to understand media (as most media have been/are being digitalized), to search for information and be critical about what is retrieved (given the wide uptake of the Internet) and to be able to communicate

5 Ferrari, Anusca. "Digital Competence in practice: An analysis of frameworks." Sevilla: JRC IPTS.(DOI: 10.2791/82116) (2012).

with others using a variety of digital tools and applications (mobile, internet). All these abilities belong to different disciplines: media studies, information sciences, and communication theories. Analysing the repertoire of competences related to digital literacy requires an understanding of all these underlying conceptualisations. Moreover, other additional aspects have emerged as new requisites for being functional in a digital environment, such as for example the ability to peruse hyperlinked texts. (Ferrari, 2012)

The issue of the definition of digital competence is complicated when considering teachers' skills, knowledge and attitudes toward technologies. As Balanskat (2010) points out, teachers' professional communities as well as researchers and education policy makers are aware that teachers need to be trained and assessed in digital competence that is more than functional skills or information literacy: many teacher professional development programmes cover pedagogical ICT targets as opposed to basic ICT functional knowledge, even if those targets are still described in a very general way and pedagogical digital competence is still a working concept for educational research.

For a deeper understanding of the complexity, Ilomäki et al. (2011)⁶ in their literature review tried to map the digital competence of teacher but the study pointed out that this topic was poorly developed in the existing frameworks and also in theoretical research;

The technological-pedagogical competence of teachers was emphasized, referring to teachers' ability to apply technology in their pedagogical practices, but mostly in a static and traditional way, demonstrating that digital technologies were not considered as means for more comprehensive transformation of pedagogical practices or educational objectives.

Ilomäki et al. mention the work of Krumsvik et al. (2008⁷) as an exception to this trend as it defines a model of competence with several dimensions that take in account pedagogic issues:

Krumsvik (2008) presented a Digital literacy model for teachers, where teachers' competence is defined to include Basic ICT skills; Pedagogic-didactic ICT competence (an ability to use ICT in teaching subject in a reflective and well-founded way); Learning strategies and metacognition (teachers' metacognition about their professional development and pedagogical content knowledge, with a special focus on digital competence); and Digital bildung (highlighting a strong ethical and moral awareness concerning the usage of ICT). The level of proficiency in these basic aspects is described through the following two dimensions: Practical proficiency (Adoption – Adaption – Appropriation – Innovation) and Self awareness concerning digital competence (from unaware and incompetent to high

6 Ilomäki, L., Kantosalo, A., & Lakkala, M. (2011). Which areas of digital competence are important for a teacher? Linked portal. Brussels: European Schoolnet (EUN), 1-12.

7 Krumsvik, Rune Johan. ;Situating learning and teachers' digital competence." Education and Information Technologies 13.4 (2008): 279-290.

awareness).

Pedagogical digital competence has been investigated outside the European context. Two major pieces of research have developed models of the competence that, in our opinion, express a good level of maturity: the *ICT Competency standard for teachers*⁸ defined by UNESCO and the *Technological Pedagogical Content Knowledge Model*⁹ by Mishra e Koehler.

The UNESCO framework is an attempt to identifying pedagogical digital competence to define a framework for teacher professional development and it articulates the competence in six areas (Understanding ICT in education, Curriculum and assessment, Pedagogy, ICT organization and administration, Teacher professional learning). Of relevance to the current study, it provides defines three levels: *Technology literacy*, related to technological competence, *Knowledge Deepening*, related to capacity apply technology in real problem solving and *Knowledge Creation*, related to the capacity to use technology to produce new knowledge.

TPACK takes the competence model from the Shulman's idea of *pedagogical content knowledge* (1986)¹⁰ and identifies teacher's digital competence as the intersection of three primary forms of knowledge: Content (CK), Pedagogy (PK), and Technology (TK). We consider this framework interesting as it "brings back content in the game", stating that the digital competence of a teacher may differ according to the subject of teaching.

Literature reviews describe an evolving scenario regarding the assessment of teachers' digital competence, with a slower pace compared to changes in the definition of digital competence. Ferrari points out that "the majority of frameworks are still based on skills development and on the ability to use a specific set of tools and/or applications" while the Balanskat review, focusing on teachers' digital competence assessment, identifies only a few countries that provide any assessment at all in teacher initial training or professional development¹¹.

UNESCO ICT Competency standards was released with guidelines for the implementation of courses. These guidelines offer an overview on assessment of pedagogical digital

8 Khan, A. W. (2008). *ICT competency standards for teachers*. Paris: United Nations Educational, Scientific and Cultural Organization.

9 Koehler, Matthew J., and Punya Mishra. "Introducing tpck." *Handbook of technological pedagogical content knowledge (TPCK) for educators* (2008): 3-29.

10 Shulman, L.S. (1986). Those who understand: Knowledge growth in teaching. *Educational Researcher*, 15(2), 4-14.

11 *With the exception of Switzerland, where ICT based knowledge for primary teachers is not assessed, digital competence is similarly assessed during in service training courses for primary and secondary school teachers in the countries surveyed. In Portugal, Slovakia, Lithuania and the Czech Republic, digital literacy, mainly referring to knowledge and skills, is assessed within in service training courses for primary and secondary school teachers. In the Czech Republic this type of assessment only takes place in specialised ICT oriented courses. Lithuania is the only country which assesses attitudes towards digital competence of teachers during in service training courses. (Balanskat, 2010)*

competence: UNESCO suggestions tends to favour situated assessment, in which teachers are evaluated for their capacity to apply knowledge and skill in their professional context. The guidelines recommend providing mainly learning design activities, design of learning artefacts or simulations of teaching practices. TPACK authors do not mention assessment in the work examined, but they share with UNESCO an orientation toward situated learning and learning by design strategies in teacher professional development.

Benchmark framework

In the following paragraphs we review certification tools currently in use in different countries. Our intention is to provide a description of these models and to understand which are the elements that could be transferred to the MENTEP project. For this reason, we describe the key characteristics of each tool:

- General description
- Target: e.g. pre-service/in service teachers, disciplines
- Content
- Type of assessment
- Comments (including the presence of content and assessment on digital competence, flexible certification that can be modified according to the evolution of the evolution of theoretical research on teachers' digital competence and the presence of pedagogic and technical solution for situated assessment.

Certification models reviewed

ACTIC: Accreditation on Competence in Information and Communication Technologies

General description	<p>ACTIC is the Accreditation on Competence in Information and Communication Technologies. It is an instrument for citizens to prove officially to public administrations, private companies and educational institutions its skills with ICT. It is addressed to citizens aged 16 or more.</p> <p>The ACTIC model defines both realizations and indicators needed to evaluate every competence ACTIC in all the three levels and the knowledge, procedures and attitudes that training should provide to be able to prove competences in every case.</p> <p>http://acticweb.gencat.cat/ca</p>
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Target	Citizens above 16 years of age
Content	<p>ACTIC assesses six different areas of competence:</p> <ul style="list-style-type: none"> • Digital culture, participation and citizenship; • Computer and operating system • Navigation, search engines and online communication • Digital textbook • Digital video and graphics • Digital sound
Type of assessment	<p>Test and performance based (simulations, sequences of steps)</p> <p>An individual synchronous exam, in the place, date and time chosen by the aspirant from the available offer.</p> <p>Tests are taken in collaborating centres (over 300 centres in Catalonia) approved by the Government, so that right conditions for taking the exam are warranted. An automatic exam is prepared from an aleatory subset of questions of different kinds. Limited time is available to take the exam.</p> <p>The same system is used for evaluating the three levels, simply changing the set of questions and the given time for taking the test.</p> <p>Questions are completely evaluated in every dimension. Technology serves to this pedagogic purpose.</p> <p>This system allows:</p> <ul style="list-style-type: none"> • To obtain results after taking the test. • Immediately download of certificates in digital format if test is passed. • If test is failed, recommendations about competences that need to be improved are provided. • If an aspirant disagrees with test result, a revision can be requested.
Comments	<p><i>Pros</i></p> <ul style="list-style-type: none"> • Three different ministries (Governance and Public Administration, Education and Employment) coordinate and support the action, plus social agents and representative entities in the ICT environment. • Certification is based on performance tests

	<p><i>Cons</i></p> <ul style="list-style-type: none"> • Certification is based on a generic definition of digital competence and for a generic target with no reference to pedagogic aspects
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CERTIPASS: Microsoft Certified Educator

General description	<p>The Microsoft Certified Educator (MCE) program provides tools that help educators drive best-in-class integration of information and communication technology (ICT) into classroom instruction.</p> <p>Mapped to the UNESCO ICT Competency Framework for Educators, MCE program resources include a free self-assessment, free customized eLearning, and the Technology Literacy for Educators (62-193) certification exam. Each of these learning and validation steps aligns to six key aspects of ICT and pedagogy integration:</p> <ul style="list-style-type: none"> • Education Policy • Curriculum & Assessment • Pedagogy • ICT/Technology Tools • Organization & Administration • Professional Development <p>http://www.certiport.com/PORTAL/desktopdefault.aspx?tabid=762&roleid=101</p>
Target	Pre-service and in-service teachers
Content	<p>The Technology Literacy for Educators (62-193) exam does not assess proficiency in using specific technology tools but whether an educator or administrator understands how to assimilate ICT tools into the six content domains listed above. This exam is designed to validate these skills in pre-service and in-service educators.</p> <p>The skills validated are:</p> <ul style="list-style-type: none"> • comprehension of the principles of the UNESCO ICT Competence Framework for Teachers • how to integrate ICT into the curriculum • how to improve learning through ICT • how to manage the classroom through ICT • how to improve professional tasks
Type of assessment	Assessment is structured on 3 separate test modules with 45 questions per module and 45 minutes per module. Test training is available in CD ROM format.
Comments	<p><i>Pros</i></p> <ul style="list-style-type: none"> • The certification is built on a solid framework for pedagogic digital competence (ICT Competency Standard UNESCO).

	<p><i>Cons</i></p> <ul style="list-style-type: none"> • Very simple testing model, based on textual items • The release of certification do not foresee any form of situated assessment
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CERTIPORT Digital Literacy

General description	<p>The CERTIPORT Digital Literacy is a certification developed Pearson and targeted for a general adult audience. It has a three level standards structure:</p> <ul style="list-style-type: none"> • <i>Standard 3</i> Computing Fundamentals, Key Applications, and Living Online • <i>Standard 4</i> that focus on Computing Fundamentals, Key Applications, Living Online • <i>Standard 5</i> Computing Fundamentals, Living Online, and Key Applications <p>http://www.certiport.com/portal/desktopdefault.aspx?tabid=669&roleid=101</p>
Target	<u>Students and employees</u>
Content	Modules focus on a general digital literacy definition.
Type of assessment	<ul style="list-style-type: none"> • Online (with browsing lock), but into CERTIPORT testing centers. • Test and performance based tasks. • Type of items: <ul style="list-style-type: none"> • multiple choice • simulation items • typing text • matching items
Comments	<p><i>Pros</i></p> <ul style="list-style-type: none"> • The articulation in three different standard sets <p><i>Cons</i></p> <ul style="list-style-type: none"> • The certification is built on a general digital literacy definition with no significant reference to pedagogic issues

ECDL / ICDL for Teachers

General description	<p>ICDL is a certification design for teaching professional and built on the ECDL Framework: http://www.ecdl.org/index.jsp?p=100&n=330</p>
Target	In service and pre-service teachers
Content	<p>ICDL focus on the ability of:</p> <ul style="list-style-type: none"> • save time using technologies

	<ul style="list-style-type: none"> • improving teaching practices • improve communication skills through technologies
Type of assessment	Assessment is performed in authorized local test centres with simple written tests
Comments	<p><i>Pros</i></p> <ul style="list-style-type: none"> • ECDL is a worldwide known certification <p><i>Cons</i></p> <ul style="list-style-type: none"> • Certification is based on simple textual test

EIPASS Teacher

General description	<p>The new EIPASS teacher is founded upon ICT Competency Standards for Teachers, a referential model created in order to uniform, evaluate and certify the computer skill required of teachers and educators, developed and published by UNESCO (United Nations Education, Science and Culture Organization).</p> <p>In addition, in line with the latest legal guidelines (For Italy, Law 170/2010 and subsequent Action Decree 5669 July 12th 2011), a particular attention is paid to the employment of hardware and software resources in the view of a full inclusion and as aid for students with special educational needs.</p> <p>http://en.eipass.com/certifications/teacher/</p>
Target	In service teachers
Content	<p>The EIPASS teacher is based on five modules:</p> <ul style="list-style-type: none"> • Hardware and software in the learning environment • Internet and its services in professional and operational contexts. • Web 2.0, social networks and cloud computing • Curricular-teaching programming. • Special educational needs and ICT tools for inclusion.
Type of assessment	<p>EIPASS services are distributed through a network of over 1000 Ei-Centres all over the world and in line with the requirements defined at international level requested by CERTIPASS.</p> <p>The international digital skills programme EIPASS is managed through the use of innovative resources analysed, designed, implemented and continuously updated by Certipass in order to provide Ei-centres and candidates with practical and easy to use tools.</p> <p>Ei-Card is the identification card of the EIPASS Candidate, provided with a</p>

	<p>unique identification code and issued by Ei-Center when registering. The Ei-Card allows to choose the certification programme more suitable to one's own needs, free login to the services of Classroom 3.0 and to the examination system valid for obtaining EIPASS certifications.</p> <p>The examination is carried out online, through the Didasko platform. Each test is composed by 30 items, the candidate has 30 minutes for answering and to get the certification has to correctly answer to at least the 75% of the items. The examination can be carried out also in different steps, without adjunct costs.</p> <p>Certipass has activated EIPASS Verify (http://en.eipass.com/eipass-verify/), an easy and fast service allowing with a simple click to verify the authenticity of the ei-card and of the certificates released by our Authority at the end of each certification course.</p> <p>Eipass Verify is an open tool, especially useful for Authorities, Public Administrations and Universities. Through EIPASS Verify, Authorities and public administrations will be able to verify in real-time the authenticity of certificates provided by users for acquiring score in rankings and public competitions, while Universities will use Eipass Verify as warrant for the certifications valid to acquire learning credits.</p>
Comments	<p><i>Pros</i></p> <ul style="list-style-type: none"> • The certification is built on a solid framework for pedagogic digital competence (ICT Competency Standard UNESCO). • Presence of a learning environment (Classroom 3.0) with synchronous and asynchronous tools and the possibility to chat with a tutor. • Ei-Book valuable as a free download for every exam module of the chosen certification course • Online exam simulator free of limitations. <p><i>Cons</i></p> <ul style="list-style-type: none"> • The release of certification do not foresee any form of situated assessment • Very simple testing model, based on textual items

EIPASS Digital School

General description	<p>The EIPASS Digital School computer certification programme concerns delving into tools, techniques and technologies strictly linked to Web 2.0 applied to education.</p> <p>The certified teacher has the theoretical and practical foundations to</p> <ul style="list-style-type: none"> • create and manage new ways to interact with students;
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	<ul style="list-style-type: none"> • modern and effective teaching methods, supported by ICT; • online and offline interactive lessons; • e-learning platforms and tools, i.e. Moodle, Atutor; Docebo, Multiuser Weblog; • Scorm-compatible teaching tools (Learning Object) • create digital books with the ebook technology and self publishing <p>http://en.eipass.com/certifications/digital-school/</p>
Target	Pre-service, in-service teacher
Content	<p>As socio-constructivism is the theoretical framework of EIPASS Digital School, the main focus is on the use of technology to enhance student centred learning.</p> <p>Eipass <i>Digital School</i> contemplates the following exam topics:</p> <ul style="list-style-type: none"> •basic information technology; •teaching technologies; •learning environments and contents management; •digital publishing for education
Type of assessment	The same as EIPASS TEACHER
Comments	<p><i>Pros</i></p> <ul style="list-style-type: none"> • The student centred learning approach <p><i>Cons</i></p> <ul style="list-style-type: none"> • The framework and the content is set on online learning situations and lexicon: a little attention is played to classroom management with technology • Very simple testing model, based on textual items • The release of certification do not foresee any form of situated assessment

EIPASS IMB (Interactive Multimedia Board)

General description	<p>EIPASS IMB is the Certification Programme certifying competences and skills necessary to qualify as a professionally prepared trainer for a mature and informed use of the Interactive Multimedia board.</p> <p>http://en.eipass.com/certifications/imb-interactive-multimedial-board/</p>
Target	Teachers, trainers, speakers, instructors, guides, communication operators.

Content	The EIPASS IMB programme is articulated into 5 exam modules: <ul style="list-style-type: none"> • Hardware Components of IMB system • Software Components • Tools and techniques for creating “Learning Objects” • Presenting and sharing materials in Learning Environment • Using IMB for an inclusive-type teaching
Type of assessment	The same model of EIPASS teacher
Comments	<p><i>Pros</i></p> <ul style="list-style-type: none"> • The focus on one of the most widely adopted classroom setting • The focus on inclusive teaching <p><i>Cons</i></p> <ul style="list-style-type: none"> • It is strongly product-oriented • Very simple testing model, based on textual items • Certification does not include any form of situated assessment • Classroom ICT setting management is not much considered

I-Skills

General description	<p>I-Skill is a test that features real-time, scenario-based task that measure an individual's ability to navigate, understand and critically evaluate the variety of information available through digital technology.</p> <p>It has been released by ETS (https://www.ets.org) a no-profit company that develops, administers and scores more than 50 million tests annually in more than 180 countries at more than 9,000 locations worldwide.</p>
Target	Students
Content	<p><i>iSkills</i> assesses students' digital literacy and their ability to synthesize many different types of data and make sound judgments about what's accurate, relevant and useful. Students should prove to be able to:</p> <ul style="list-style-type: none"> • Evaluate the usefulness and sufficiency of information for a specific purpose • Create, generate or adapt information to express and support a point • Communicate information to a particular audience or in a different medium • Define an information problem or formulate a research statement

	<ul style="list-style-type: none"> • Access, summarize and integrate information from a variety of digital sources
Type of assessment	I-Skill is an hour long test based on real-time scenario tests
Comments	<p><i>Pros</i></p> <ul style="list-style-type: none"> • Competence is certified through scenario based task <p><i>Cons</i></p> <ul style="list-style-type: none"> • The certification is built on a general digital literacy definition with no significant reference to pedagogic issues

NAACE ICT Mark

General description	<p>The Naace ICT mark is a quality based on the Self-review Framework (SRF). The framework provides a structure for reviewing your school's use of technology and its impact on school improvement. The purpose of the Self-review Framework is to support school improvement through a reflective practice that allows schools to measure and improve their provision against a well-researched and evidenced set of criteria such that pupils become digitally literate and are, 'able to use and express themselves and develop their ideas through information and communications technology'.</p> <p>The Self-Review Framework is periodically revised following consultation with teachers, head teachers, and all leading stakeholders.</p> <p>https://www.naace.co.uk/school-improvement/ict-mark/</p>
Target	Schools
Content	
Type of assessment	To receive the Naace ICT mark, schools need to apply and to fill an online tool. An ICT mark assessor contacts the school to fix an on site assessment.
Comments	<p><i>Pros</i></p> <ul style="list-style-type: none"> • The framework takes in a account the pedagogic dimension of teaching with technology <p><i>Cons</i></p> <ul style="list-style-type: none"> • Certification is based on authentic assessment but it is applicable only to schools

EUN Academy – Open Badge System

General description	<p>The European Schoolnet Academy is a platform for online professional development courses for teachers in primary and secondary schools. It delivers MOOCs on innovative teaching practices, mainly with technologies.</p> <p>EUN Academy delivers five week long courses with introductions of key pedagogical concepts and examples of everyday classroom practice.</p> <p>Course are divided into modules. Participants are encouraged to reflect and exchange on course topics in an online community of professionals.</p>
Target	Pre-service, in-service teacher
Content	
Type of assessment	<p>Accreditation is performed with an Open badge solution (http://openbadges.org/about/), delivered by the Mozilla foundation. Open badge can be earned at the end of each module, answering to a quiz or completing other types of tasks.</p> <p>If a participant completes all the modules, he/she receives a digital course badge.</p>
Comments	<p><i>Pros</i></p> <ul style="list-style-type: none"> • Open badges are a standardized solution for the accreditation of online learning, with a high level of technological portability. • Open badges can be applied to a variety of assessment methods <p><i>Cons</i></p> <ul style="list-style-type: none"> • The risk of gamification • Open badge are not yet recognized by ministries of education for professional development

Conclusions and recommendations

The review reveals that only a few certification models of digital competence (e.g. ECDL) are more common and widespread than of pedagogical digital competence (e.g. *Eipass certification* products). This second category is more relevant to the MENTEP project aims, but according to the certification models taken into an account in this review, there only very few cases that deal with application the certification. Existing frameworks on this particular pedagogical digital competence, such as the *UNESCO ICT Competency Standard for Teachers*, are used as knowledge base for aspects and dimensions assessed and to build up the content of assessment. Although these frameworks emphasise the situational nature of the competence to assess, the most common type of assessment is still a written test, both online or in face-to-face

situations. I-skill certification is an exception: although this certification is not directly for teachers, the real-time and scenario-based assessment task may be relevant in a future cross-border certification model.

There are few models that can be used as a resource for the implementation of a new certification model. Though the theoretical framework on pedagogical digital competence shows a good level of maturity and can serve as robust background for the certification, there are few examples of certification released with authentic assessment. Further work is needed to explore the use of these types of assessment in professional development, with a focus on online learning and community of practice, and to deepen the knowledge of possible uses of authentic assessment for certification.

6: Conclusions

This chapter summarises the findings from the survey and follow-up interviews and discusses future possibilities and prospects, taking into account discussions at MENTEP consortium meetings.

Summary of findings

Professional Development

In the 14 countries surveyed, professional development (PD) tends to be linked either to a salary increase or promotion, or both. There is a wide range of PD providers, most commonly universities, ministries, public bodies and commercial companies. Online PD exists in all countries although to a limited extent in some and face-to-face PD tends to take place in schools and to last one day or less. PD also tends to be compulsory, but is not in five countries. Where it is, it amounts to the equivalent of 18 to 35 hours a year typically, though can be as many as 12 days (in the Czech Republic). In some countries restrictions are placed on teachers' choice of CPD courses, while in others there is more flexibility and devolved choice to schools or teachers themselves. Online courses are compulsory in only three countries (France, Portugal and Scotland).

Certification

In almost all countries, courses are reviewed for official approval. The typical accreditation provided for teacher training is a certificate issued by the training provider, validated by an official body. Courses are formally approved by government, university or an official body, and an external university or ministry of education (or a ministry regional centre) assesses and certifies achievement. There appears to be a widespread centralised view among the countries surveyed regarding the accreditation and certification of courses for the professional training of teachers. Certification is considered a public task: universities, ministries of education and local government authorities have a duty to monitor and approve courses and providers. Commercial bodies do not play a role in approving, monitoring, assessing or certifying achievement or courses.

Certification is based on mixed methods which include authentic tests (portfolios, lesson plans, diaries and multimedia lessons. In many cases it is managed online, but in some cases the final assessment is based on the production and discussion of a paper thesis (as in Norway). There are closed and quantitative approaches as well as open and quantitative approaches, but no evidence of proctoring during online observation of examinees. Teacher assessment online is based on closed tests, situated tests, simulations and open-ended answers. If there are open-ended tests (production of artefacts, lesson plans, etc.), learners are evaluated by experts (tutor, senior teacher) in most cases. No country has a system to verify the identification of the examinee during

the test, and if a country said they had, they didn't specify how in practice, e.g. proving one's identity in a virtual learning environment. No countries currently use intelligent agents or other automatic assessment approaches and in only four are there forms of peer assessment: Scotland, Slovenia, Finland (where it takes the form of peer feedback) and Spain.

Teachers' digital competence

Digital competences are on the training agenda of all the countries surveyed. Some countries (France, Slovenia, Spain, Italy, Estonia) include digital platforms for training teachers in digital competences.

MOOCs are an emerging model of training in digital competence in some countries, as a way to reach a large amount of teachers at the same time. Some countries are also experimenting with a different version of this format: NOOCs, which are extremely focused short courses. The outcomes in these environments are often assessed through a peer-to-peer process (Spain, Portugal). Other countries (France, Italy) have dedicated platforms for training teachers in their first year of teaching (induction); in these cases, evaluation is by experts or experienced teachers at school, who also evaluate products and artefacts uploaded to an online environment.

Assessment of teachers' digital competence tends to be qualitative rather than quantitative (e.g. closed tests). In most cases digital competence is evaluated through a blended model in which there is online and face to face assessment, often based on observation, or recordings of real work in class. In some cases, France and Spain for example, assessment is mainly based on portfolios and diaries reporting activity. In other cases, as in Slovenia, there is also real-time assessment based on observation of work in class and of collaborative work online. In countries in which there is online assessment, it is often accompanied by authentic assessment based on real situations. All these methods seem to be quite far from the certification models proposed by commercial organisations, which are mainly based on quizzes and contextually-based tests. In some cases, for example induction in France and Italy, authentic assessment is performed by experts who are part of the school context and who also evaluate work in classroom during the year.

Specific rubrics are considered useful for the comparability of qualitative assessment among both candidates and assessors; Slovenia, Spain, Estonia for example, use them. Rubrics may combine done/not done criteria (useful for measuring the presence of specific behaviours which are indicative of digital competences), points and ratings which give different weights to different behaviours. Qualitative criteria are based entirely on the subjective evaluation of assessors.

External assessment can be accompanied by self-assessment activities (Spain, Italy), in order to situate competence development within a responsible and self-reflexive

attitude among teachers and thereby not threaten their professionalism. In countries such as Norway or Denmark, there can be scepticism about external assessment, it being perceived as a formal or intrusive practice not linked to a personal attitude or aim. Rarely at present is there a digital certificate for competences achieved, but in Spain, Finland and Cyprus, Open Badges are used, and Slovenia uses an e-card, which profiles teachers' progress in competence development.

In digital environments used for the training and testing, proof of identify is an issue. There is no evidence of authentication with video camera, voice recognition or other methods (e.g. in proctoring models). Instead authentication of the user is often through interaction over time on the platform among the actors and uploading really contextualized products. Reference to real cases and examples, together with the user ID and authentication password are considered sufficient conditions to avoid cheating in Slovenia.

Existing certification instruments

The review reveals that only a few certification models of digital competence (e.g. ECDL) are more common and widespread than of pedagogical digital competence (e.g. *Eipass certification* products). This second category is more relevant to the MENTEP project aims, but according to the certification models taken into an account in this review, there only very few cases that deal with application the certification. Existing frameworks on this particular pedagogical digital competence, such as the *UNESCO ICT Competency Standard for Teachers*, are used as knowledge base for aspects and dimensions assessed and to build up the content of assessment. Although these frameworks emphasise the situational nature of the competence to assess, the most common type of assessment is still a written test, both online or in face-to-face situations. I-skill certification is an exception: although this certification is not directly for teachers, the real-time and scenario-based assessment task may be relevant in a future cross-border certification model.

There are few models that can be used as a resource for the implementation of a new certification model. Though the theoretical framework on pedagogical digital competence shows a good level of maturity and can serve as robust background for the certification, there are few examples of certification released with authentic assessment. Further work is needed to explore the use of these types of assessment in professional development, with a focus on online learning and community of practice, and to deepen the knowledge of possible uses of authentic assessment for certification.

Conditions and characteristics of successful assessment and certification

Online professional development

Online professional development is found in many countries notably Spain, Italy, France,

Slovenia, Finland, Portugal, but it is only just beginning in countries like Cyprus. In general, teachers are not yet familiar with online PD and will need to get used to how they work and expectations of participants. Younger teachers are enthusiastic about ICT and are motivated to develop their competence, but insecurity also plays a role: teachers want to do all they can to enhance their job security. Large numbers of Greek teachers took part in the first MENTEP MOOC (despite language barriers, particularly in the case of older teachers), indicating a high demand for this type of training, at least in Greece. Courses in English would not be a barrier, in Cyprus for example, particularly for younger teachers. Teachers in the early years of their career would appreciate the opportunities offered in new courses to work with teachers from other countries.

Assessment

Most of the existing assessment models do not focus on digital pedagogical competence. The report also notes that there is no widely agreed definition or standards for defining this type of competence. This affects validity, reliability and rigour. In only a few cases does there seem to be interest in linking teacher PD to overall school improvement or, identified needs from teacher appraisal.

At present blended models of assessment (based on online tasks plus authentic experiences) are the most widespread means of assessing teachers' digital competences. Authentic assessment tends to be based on products and artefacts (portfolios, reports) rather than on real time observation of classroom experiences: physical observation or video recording of lessons in classroom are rarely found. Portfolios are the most common method for authentic assessment: France, Italy, Slovenia, Spain, Estonia, Lithuania use them for external and self-assessment. Innovative ways of competence assessment and certification are already taking place in Greece where they are included in the A-level assessment, in which candidates are asked to deal with a real situation, e.g. changing an Excel file. At higher levels such tasks would be more complex and technically demanding to design and implement. Closed quizzes and tests are used, among other methods, only in Lithuania, Spain, Slovenia.

Certification

Open badges are found in Finland and Spain. Slovenia uses an e-card which tracks the progresses of teachers. In other countries (CZ, CY, EL) teachers' level of understanding of badges is low and it could be difficult to imagine how they would be integrated into the current system. In some cases (CZ), teachers find a simple certificate of attendance / participation is enough; it proves the training took place. Certification is sometimes used for teachers at the beginning of their career (FR; IT). It includes modules related to digital competences and, after a period of training, it is used as confirmation step for the entry into the profession.

Although it would be challenging to establish a common European certification model for teacher competence in digital pedagogy, such cross-border or European certification

is likely to be of interest to teachers. Many would be interested in European certification even if it was a simple certificate on paper to add to a portfolio. The currency of such certification is an issue: teachers will need to be convinced how it can be exchanged for promotion and lead to better teaching.

Reactions to a common European certification of teachers' digital competence are likely to vary between countries. Teachers in the early years of their career would appreciate opportunities to accumulate PD hours (in Cyprus and in Italy for example). In the Czech Republic, such certification could form part of teachers' PD portfolios. Given Norwegian teachers' personal commitment to developing their competence, there is little interest in badges and similar incentives. Moreover, there is union opposition to this form of recognition, seeing them as a threat to the professionalism of teachers. A paper certificate with name and a description of the course content often suffices, together with formally recognised credits where available. Any international certification proposed in MENTEP would have to align with the Bologna process for academic credits. In place since 1998 across the European Union, a year's study at another university leads to 60 credits. This would only be needed if it is to have an impact on teachers' salaries in Norway.

Recommendations

Assessment

1. An assessment model entirely based on online tests may not currently be feasible, but knowledge based areas such as digital awareness can be more easily assessed with multiple choice assessments
2. Motivation should come from teachers, based on the perception of the assessment as a way to grow, not to be judged. At the same time consider linking teacher PD to overall school improvement or needs identified in teacher appraisals.
3. There should be intertwining of external assessment with self-assessment and training: pure external assessment could be seen as a bureaucratic and useless task
4. Continually review and update what is assessed for digital pedagogical competence as technology and priorities evolve and in the light of research findings. A clear and shared framework of skills and attitudes to be assessed at European level is essential, but there should be modularity and scalability of the process down to local level (school and teacher): a common European framework which guarantee the possibility to compare and the mobility of the professions (Bologna Process), schools and teachers can decide to develop only specific areas of competences and to adopt only the related assessment modules.
5. Portfolios are favoured, as they can include all kinds of evidence. At the same time, portfolios are expensive to evaluate (human raters are frequently involved in assessing portfolios according to the survey results). It may be better to base their assessment on peer review (which needs to be transparent), and to also have some activities that are automatically scored. Digital production may include examples of

- digital pedagogy, learning design, artefacts, and other evidence
6. Collaborative approaches to developing and assessing digital competence are rare (e.g. in Slovenia). Nevertheless they could be very valuable as one of the key advantages of digital competence is the opportunity to work collaboratively. Adopt a peer-to-peer assessment to increase both the social acceptance of the process by teachers, and a sustainable assessment process at scale. Experts / experienced teachers should also be involved to complete the assessment by peers. Peer assessment should be structured with grids, supported by specific evidence (e.g. nurses' continuing professional development in the UK). This provides a peer system for assessment which relieves the need for external assessors.
 7. For authentication of identity, external guidance and peer checking is important
 8. There should be rubrics for sharing the parameters of judging in the open ended tests and to reduce subjectivity. For summative assessment, ensure that raters (whether peers or experts in the field) are trained/have a shared understanding of criteria by which they judge the quality of work.
 9. There should be flexibility and several ways for performing the same skill. Consider a dynamic system of items and tests that can be adapted according to specific contexts, type of teachers, schools, disciplines. Use different ways to assess the same competence, mixing self-reflexive based methods (artefacts, diaries, reports, portfolios), useful to gather declared behaviours, with real time experiences (observed or recorded), which give evidence of the capability to work and solve problems in situated and not planned conditions.
 10. Although the MENTEP TET-SAT has been developed to guide self-assessment, it is also applicable to summative assessment by external raters. Its value in generating a corpus of big data for large-scale analysis could be hampered because of different languages across Europe. Automatic analysis of texts is still difficult to do and big data also miss nuances of context.

Certification

1. Certification in MENTEP is an idea worth investigating in the future, once it is clear what the TET-SAT tool delivers and how it works, for example how it links to eco-systems.
2. European certification may be very valuable for those who want to develop online tools that can be used across countries
3. A cost-benefit analysis may be needed before countries are convinced of the need for online training and certification of digital competences.
4. There should be close links to the institutional system of credits, both at country and at international level. In terms of the relationship to national accreditation, pay and promotion, each country has to decide how to use. Ensure clear communication of the advantages of certification for teachers and its usability in their own school system and for their career.
5. Open badges are an attractive option for pan-European certification, but there are doubts about how accepted or respected they are. Local authorities need to

understand what is being awarded. For example, the badge should describe exactly what it signifies, and give details on hours of work and credits earned. Endorsement at the European level can also lend credibility to badges.

6. It is important that any certificate states what topics were covered and the dates and duration of the course, so that the head teacher can understand what took place and look for evidence of the impact of the training. It would be more credible if ministries of education approved it as well as European Schoolnet (which is of course less widely known). Certificates should also carry the logo and signature of the provider (e.g. European Schoolnet) and those of a national endorsing body, preferably the ministry. Evidence of European Commission support would also be useful.

Finally, among existing models of assessment and certification, France, Spain, Slovenia, Italy, Lithuania, Estonia, Portugal, Greece provide elements that could be part of a new cross-border assessment and certification of teachers' pedagogical ICT competence, in particular:

- Nano-MOOCs, task focused, easily modified and planned in personalised PD paths (Spain)
A modular approach based on levels (Greece, Estonia, Lithuania) and the possibility to adapt PD according to teachers' own level. Estonia's model is interesting in that there is a desire to ensure that training really builds knowledge and competence, underscoring the need to ensure that any assessment for certification is valid, rigorous and reliable.
- The Danish approach in which digital competence is not considered separately from subject teaching competence but is integrated into the training of the different disciplines.
- The presence of a mixed method based on self-assessment and external assessment (Italy, Spain)
- Peer evaluation as part of a shared idea of professionalism (Portugal, Spain, Slovenia)
- Rubrics for moderating peer evaluation (Slovenia)
- Authentic assessment based on in class performances (Slovenia)
- Video recording of lessons and of situated experiences at school, as evidence but mostly as a self-reflexive method (Italy, Slovenia)
- Open badges and digital and transferable recognition (Spain, Finland)

To conclude, this work has confirmed that there is a high level of interest in teacher training and professional development at European and national levels, an increasing emphasis on teacher appraisal for improvement, and more coherent approaches to assessment and certification. Generally speaking however, the development, assessment and certification of teachers' digital competence is still in its early stages and much can be learnt from experiences and models in the countries surveyed. There is interest in

new forms of online assessment and pan-European certification and a MENTEP prototype based on the foregoing recommendations could prove both timely and useful.

Annex: Survey questionnaire

Note: the survey was available only online at
<https://www.surveymonkey.com/r/ZSCPQG5>.

MENTEP WP6 CPD survey

This survey is a key part of the MENTEP project coordinated by European Schoolnet. It aims to gather information about teachers' professional development in your country, and particularly developments in digital assessment and digital competence training. It should take no longer than 20 minutes to complete. Only a few answers are compulsory but please provide as much information as you can.

The information will be used to provide a report on current approaches to professional development and innovations in digital assessment and competence development. No individual will be identified.

Closing date: 15 February 2016.

1. Country

Contact email address:

National approaches to professional development

2. In your country, is teachers' professional development linked to pay increases or career progression?

2a. If CPD is linked to pay/career progression, please describe how professional development is linked to pay or promotion

3. Who provides professional development (PD) for teachers? Tick all that apply.

- University
- Commercial provider
- Self- or peer-organised
- Ministry of education
- Public organisation
- Regional centre
- Other (please specify)

4. How is professional development provided? Tick all that apply, and if so whether it is compulsory.

- School-based
- In a government/regional training centre
- In a hotel/conference centre
- Online (course, MOOC, peer network...)
- Blended - face and face and online
- Courses that last one day or less
- Courses that last 2-3 days
- Courses that are longer, up to a year
- Other (please specify, and whether compulsory or not)

5. Based on the answers to the previous question, please confirm that some professional development is compulsory in your country.

- Yes, some professional development is compulsory
- No, professional development is not obligatory

5a. If some PD is compulsory describe any restrictions placed on teachers' choice of CPD courses (e.g. no restriction, certain curriculum areas only, approved courses only...).

6. How many compulsory training hours a year are there?

7. Are MOOCs and online courses compulsory alongside other types of PD?

- Yes - any MOOC
- Yes but certain MOOCs only
- No, online training is not compulsory

Accreditation

8. What types of accreditation are provided for any type of training (tick all that apply)?

- Certificate issued by the training provider
- Certificate validated by an official body (e.g. university)
- Course credit
- Open badge
- Degree or higher level qualification
- Other (please specify)

9. How is examination and certification organised, e.g. closed quizzes, open answers, situated tests, simulations, online observation of examinees(proctoring)?

10. How is the identification of the examinee verified during the online test?

11. If there are open-ended tests (e.g. producing artefacts, lesson plans), how they are evaluated and by whom (peers, experts, tutors...)?

12. If, in some cases, certification is based on online assessment of teachers, please provide a link to relevant documentation, studies, reports etc., in your language about teachers' professional development policy and certification. If the documents are not online please email them to roger.blamire@eun.org

13. Are courses reviewed for official approval?

- Yes
- No

13a. If courses are formally approved, who assesses and certifies achievement? Tick all that apply

- This organisation assesses and certifies training
- An external university
- A commercial body
- A regional centre
- The course provider
- Other (please specify)

Digital competence

14. Please describe how teachers develop their digital competence in your country.

- How assessed (e.g. levels, test, formal examination):
- Evidence expected (e.g. portfolio, projects, work with students, digital artefacts, own open educational resources):
- How validated (e.g. external, peers, moderator):
- Types of certification awarded (e.g. badge, certificate, diploma):

15. If teachers can obtain digital competence accreditation in your country please describe how it works: e.g. how assessed, what evidence is expected, how is it validated and what type of certification is given (badge, portfolio, certificate)?

16. If specific conditions apply to professional development in digital competence please describe them.