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European Framework for the **Digital Competence of Educators**

DigCompEdu

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European Framework for the Digital Competence of Educators

DigCompEdu

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Abstract

As educators face rapidly changing demands, they require an increasingly broader and more sophisticated set of competences than before. In particular, the ubiquity of digital devices and the duty to help students become digitally competent requires educators to develop their own digital competence.
On an international and national level a number of frameworks, self-assessment tools and training programmes have been developed to describe the facets of digital competence for educators and to help them assess their competence, identify their training needs and offer targeted training. Based on the analysis and comparison of these instruments, this report presents a common European Framework for the Digital Competence of Educators (DigCompEdu). DigCompEdu is a scientifically sound background framework which helps to guide policy and can be directly adapted to implementing regional and national tools and training programmes. In addition, it provides a common language and approach that will help the dialogue and exchange of best practices across borders.
The DigCompEdu framework is directed towards educators at all levels of education, from early childhood to higher and adult education, including general and vocational education and training, special needs education, and non-formal learning contexts. It aims to provide a general reference frame for developers of Digital Competence models, i.e. Member States, regional governments, relevant national and regional agencies, educational organisations themselves, and public or private professional training providers.

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Foreword

This study presents a framework for the development of educators' digital competence in Europe. It aims to help Member States in their efforts to promote the digital competence of their citizens and boost innovation in education. The framework is intended to support national, regional and local efforts in fostering educators' digital competence, by offering a common frame of reference, with a common language and logic.

JRC research on Learning and Skills for the Digital Era started in 2005. The aim was to provide evidence-based policy support to the European Commission on harnessing the potential of digital technologies to encourage innovation in education and training practices; improve access to lifelong learning; and impart the new (digital) skills and competences needed for employment, personal development and social inclusion. More than 20 major studies have been undertaken on these issues, resulting in more than 120 different publications.

Recent work on capacity building for the digital transformation of education and learning, and for the changing requirements for skills and competences has focussed on the development of digital competence frameworks for citizens (DigComp), educational organisations (DigCompOrg) and consumers (DigCompConsumers). A framework for opening-up Higher Education Institutions (OpenEdu) was also published in 2016, along with a competence framework for entrepreneurship (EntreComp). Some of these frameworks are accompanied by (self-)assessment instruments. Additional research has been undertaken on Learning Analytics, MOOCs (MOOCKnowledge, MOOCs4inclusion), Computational thinking (Computhink) and policies for the integration and innovative use of digital technologies in education (DigEduPol). A study on blockchain for education is also underway.

More information on all these studies can be found on the JRC Science hub:
https://ec.europa.eu/jrc/en/research-topic/learning-and-skills.

Yves Punie

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Executive Summary

The European Framework for the Digital Competence of Educators (DigCompEdu) responds to the growing awareness among many European Member States that educators need a set of digital competences specific to their profession in order to be able to seize the potential of digital technologies for enhancing and innovating education.

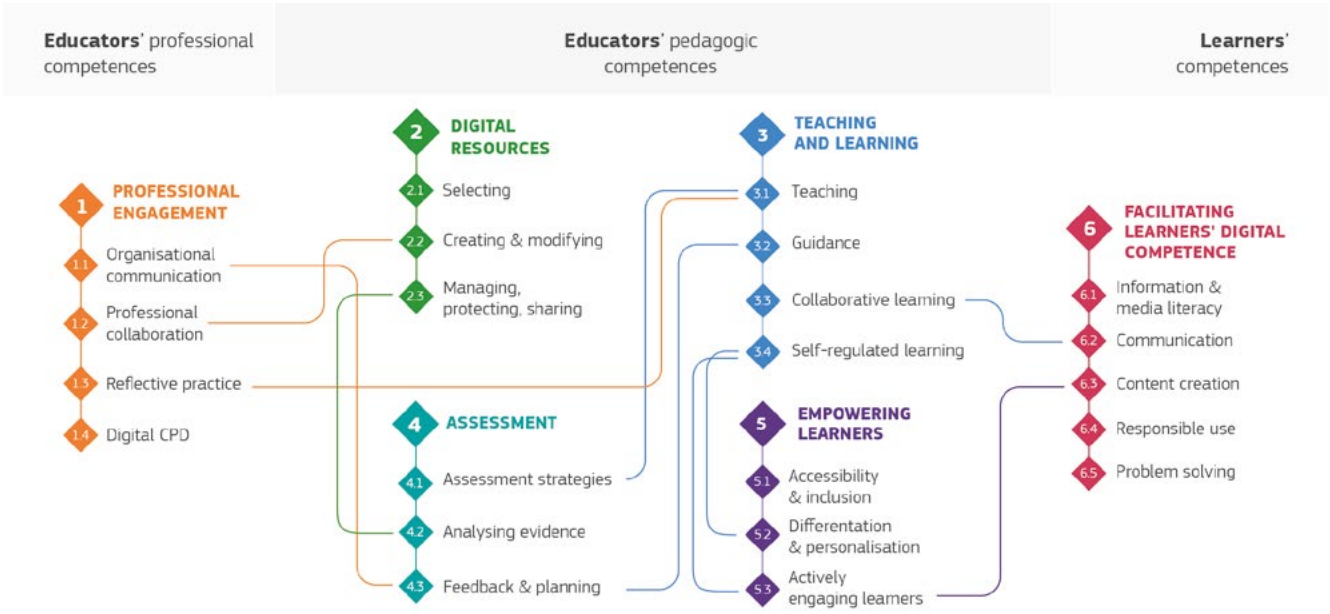

FIGURE 1: THE DIGCOMPEDU FRAMEWORK

The DigCompEdu Framework aims to capture and describe these educator-specific digital competences by proposing 22 elementary competences organised in 6 areas (Figure 1): Area 1 is directed at the broader professional environment, i.e. educators' use of digital technologies in professional interactions with colleagues, learners, parents and other interested parties, for their own individual professional development and for the collective good of the organisation. Area 2 looks at the competences needed to effectively and responsibly use, create and share digital resources for learning. Area 3 is dedicated to managing and orchestrating the use of digital technologies in teaching and learning. Area 4 addresses the use of digital strategies to enhance assessment. Area 5 focuses on the potential of digital technologies for learner-centred teaching and learning strategies. Areas 6 details the specific pedagogic competences required to facilitate students' digital competence. For each competence, a title and a short description are provided, which serve as the main point of reference (Table 7, p. 24).

The Framework also proposes a progression model to help educators assess and develop their digital competence. It outlines six different stages through which an educator's digital competence typically develops, so as to help educators identify and decide on the specific steps to take to boost their competence at the stage they are currently at. At the first two stages, Newcomer (A1) and *Explorer (A2),* educators assimilate new information and develop basic digital practices; at the following two stages, *Integrator (B1)* and *Expert (B2)*, they apply, further expand and structure on their digital practices; at the highest stages, *Leader (C1)* and *Pioneer (C2)*, they pass on their knowledge, critique existing practice and develop new practices.

The DigCompEdu Framework synthesizes national and regional efforts to capture educator-specific digital competences. It aims to provide a general reference frame for developers of digital competence models, i.e. Member States, regional governments, relevant national and regional agencies, educational organisations themselves, and public or private professional training providers. It is directed towards educators at all levels of education, from early childhood to higher and adult education, including general and vocational training, special needs education, and non-formal learning contexts. It invites and encourages adaptation and modification to the specific context and purpose.

The framework is based on work carried out by the European Commission's Joint Research Centre (JRC), on behalf of the Directorate-General for Education, Youth, Sport and Culture (DG EAC).

Acknowledgements

The DigCompEdu framework is the result of the collaborative effort of many who helped to shape and refine it in its different stages. We would like to express our gratitude to all of you.

Not all of the people we owe thanks to are known to us by name. Thus we have to thank the over 100 teachers who participated in one of the three dedicated workshop sessions that took place at the eTwinning Conference in Athens, in October 2016. You subjected our initial proposal to a reality check that helped us re-shape it to fit educators' needs. Similarly, we would like to thank the 72 participants in the online stakeholder consultations. Based on your input and feedback we have been able to come up with a much sounder and more sustainable version of the framework.

The biggest group of helpers whom we do know by name and who have been pivotal to shaping the framework is the group of European experts who participated in the DigCompEdu expert workshop. Your expertise helped us re-shuffle and re-shape the competences and competence areas to ensure overall consistency and coherence. Thank you for the lively discussions we had and the intelligent solutions that emerged: Igor Balaban, University of Zagreb, Croatia; Anja Balanskat, European Schoolnet (EUN); Helen Beetham, UK; Jeroen Bottema, Inholland University, The Netherlands; Vincent Carabott, Ministry of Education and Employment, Malta; Maria Jesús García, Ministry of Education, Spain; Michael Hallissy, H2 Learning, Ireland; Marijana Kelentric, Centre for ICT in Education, Norway; Katrin Kiilaspää, HITSA Information Technology Foundation

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Introduction

The ubiquity of digital technologies has profoundly changed almost all aspects of our lives: the way we communicate, the way we work, the way we enjoy our leisure time, the way we organise our lives, and the way we source knowledge and information. It has changed how we think and how we behave. Children and young adults are growing up in a world where digital technologies are ubiquitous. They do not and cannot know any different. This does not mean, however, that they are naturally equipped with the right skills to effectively and conscientiously use digital technologies.

National and European policies acknowledge the need to equip all citizens with the necessary competences to use digital technologies critically and creatively. The European Digital Competence Framework (DigComp), which was updated in 2016/17, responds to this need, by providing a structure which allows European citizens to better understand what it means to be digitally competent and to assess and further develop their own digital competence.

For pupils and students in compulsory education, an ample range of initiatives on European, national and regional levels offers guidelines and advice on how to enable young people to develop their digital competence, often with a focus on critical skills and digital citizenship. In most European Member States, corresponding curricula have been or are being developed to ensure that the young generation is able to creatively, critically and productively take part in a digital society.

On international, European, national and regional levels, there is consequently considerable interest in equipping teachers with the necessary competences to fully exploit the potential of digital technologies for enhancing teaching and learning and for adequately preparing their students for life and work in a digital society. Many European Member States have already developed, or are currently in the process of developing or revising frameworks, self-assessment tools and training programmes to guide teacher training and continuous professional development in this area.

The objective of the DigCompEdu framework proposed in this report is to reflect on existing instruments for educators' digital competence and to synthesize these into a coherent model that would allow educators at all levels of education to comprehensively assess and develop their pedagogical digital competence.

The DigCompEdu framework is not intended to undermine national, regional and local efforts to capture educators' digital competence. On the contrary, the diversity of approaches in different Member States contributes to a productive and ongoing debate and is welcomed. The framework aims to provide a common ground for this debate, with a common language and logic as a starting point for developing, comparing and discussing different instruments for developing educators' digital competence, at national, regional or local levels.

Thus the added value of the DigCompEdu framework is that it provides:

- a sound background that can guide policy across all levels;
- a template that allows local stakeholders to move quickly on to developing a concrete instrument, suited to their needs, without having to develop a conceptual basis for this work;
- a common language and logic that can help the discussion and exchange of best practices across borders;
- a reference point for Member States and other stakeholders to validate the completeness and approach of their own existing and future tools and frameworks.

The DigCompEdu framework is the result of a series of discussions and deliberations with experts and practitioners based on an initial literature review and the synthesis of existing instruments on local, national, European and international levels. The aim of these discussions was to reach a consensus on the main areas and elements of educators' digital competence, to decide on central and marginal elements, and on the logic of progression in digital competence in each area.

The model proposed could have taken a different shape and focus. It is not intended to undermine or question the validity and relevance of similar models that follow alternative approaches. Rather it is meant to embrace this diversity as a way of stimulating debate on the continuously changing demands on educators' digital competence.

The framework is based on work carried out by the European Commission's Joint Research Centre (JRC), on behalf of the Directorate-General for Education, Youth, Sport and Culture (DG EAC).

DigCompEdu

in a nutshell

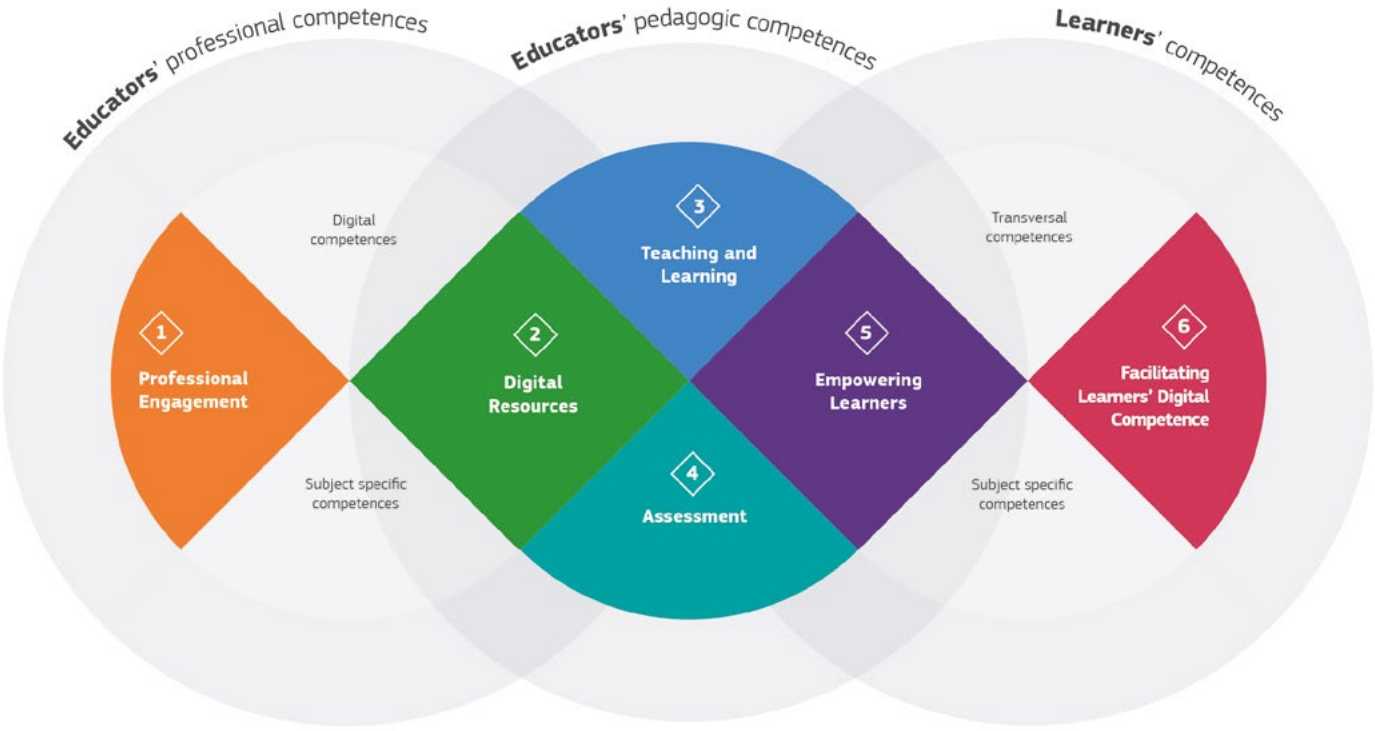


FIGURE 2: DIGCOMPEDU AREAS AND SCOPE

Educators are role models for the next generation. It is therefore vital for them to be equipped with the digital competence all citizens need to be able to actively participate in a digital society. The European Digital Competence Framework for Citizens (DigComp) specifies these competences. DigComp has become a widely accepted tool for measuring and certifying Digital Competence and has been used as a basis for teacher training and professional development across and beyond Europe. As citizens, educators need to be equipped with these competences to participate in society, both personally and professionally. As role models, they need to be able to clearly demonstrate their digital competence to learners and to pass on their creative and critical use of digital technologies.

However, educators are not just role models. They are first and foremost learning facilitators, or more plainly: teachers. As professionals dedicated to teaching, they need, in addition to the general digital competences for life and work, educator-specific digital competences to be able to effectively use digital technologies for teaching. The aim of the DigCompEdu framework is to capture and describe these educator-specific digital competences.

The DigCompEdu framework distinguishes six different areas in which educators' Digital Competence is expressed with a total of 22 competences (see Figure 3, p. 16).

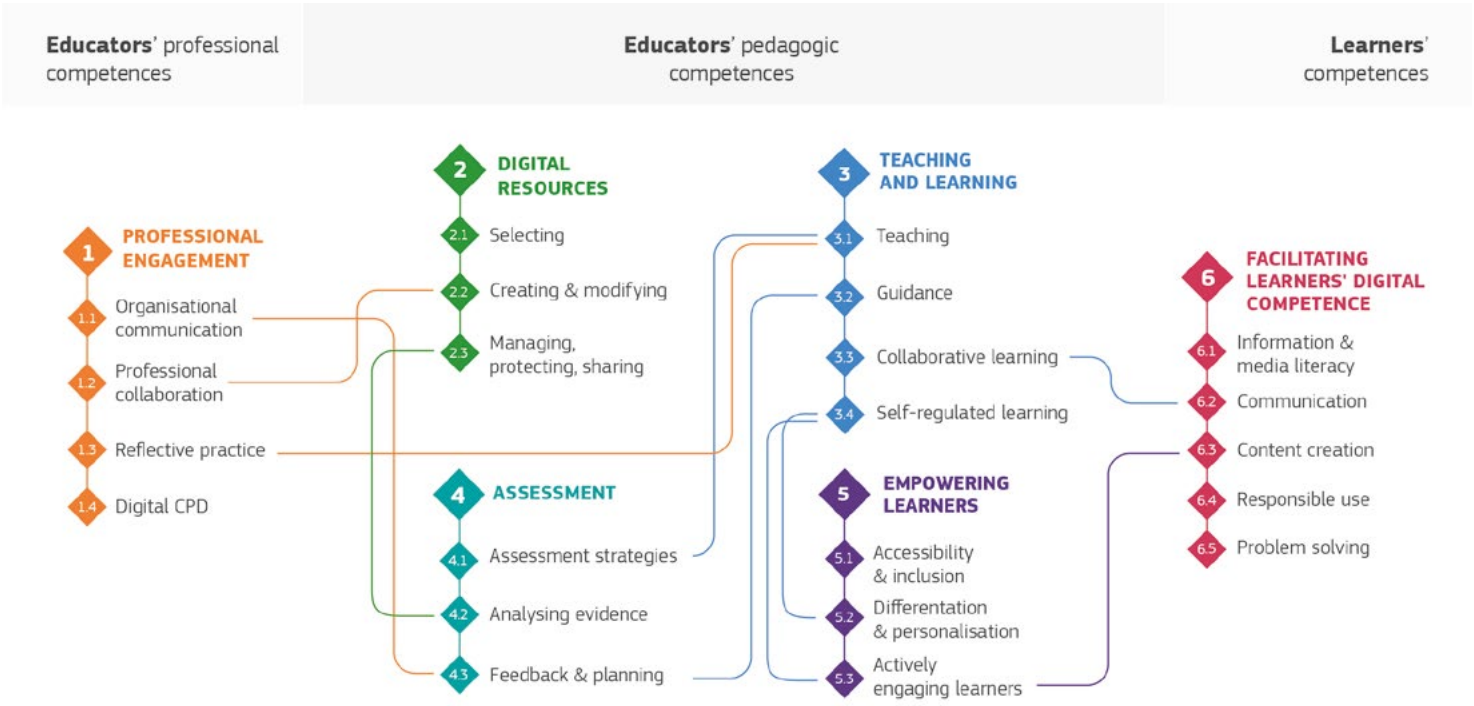


FIGURE 3: DIGCOMPEDU COMPETENCES AND THEIR CONNECTIONS

The six DigCompEdu areas focus on different aspects of educators' professional activities:

Area 1: Professional Engagement

Using digital technologies for communication, collaboration and professional development.

Area 2: Digital Resources

Sourcing, creating and sharing digital resources.

Area 3: Teaching and Learning

Managing and orchestrating the use of digital technologies in teaching and learning.

Area 4: Assessment

Using digital technologies and strategies to enhance assessment.

Area 5: Empowering Learners

Using digital technologies to enhance inclusion, personalisation and learners' active engagement.

Area 6: Facilitating Learners' Digital Competence

Enabling learners to creatively and responsibly use digital technologies for information, communication, content creation, wellbeing and problem-solving.

The core of the DigCompEdu framework is defined by Areas 2-5. Together these areas explain educators' digital pedagogic competence, i.e. the digital competences educators need to foster efficient, inclusive and innovative teaching and learning strategies. Areas 1, 2 and 3 are anchored in the stages characteristic of any teaching process, whether supported by technologies or not. The competences listed in these areas detail how to make efficient and innovative use of digital technologies when planning (Area 2), implementing (Area 3) and assessing (Area 4) teaching and learning. Area 5 acknowledges the potential of digital technologies for learner-centred teaching and learning strategies. This area is transversal to Areas 2, 3 and 4 in the sense that it contains a set of guiding principles relevant for and complementary to the competences specified in these areas.

To give an example, educators proficient in Area 2 will select, create and adapt digital resources to suit the learning objective and existing competence level of the learner group. They will ideally choose and/or compile learning activities that help their learners to effectively achieve a given learning objective. An educator proficient in Area 5 will select, create and adapt digital resources to empower learners. In this respect, he/she will make the resources accessible to all learners; foresee different, personalised learning pathways; and design the resources so as to actively involve and engage all learners. Obviously, a digitally-competent educator should consider both sets of objectives, i.e. address the concrete learning objective (Area 2) and empower learners (Area 5). Whereas the former is specific to the process of selection or creation, the latter is generically applicable to all competences in Areas 2-4.

This pedagogic core of the framework is complemented by Areas 1 and 6. Area 1 is directed at the broader professional environment, i.e. educators' use of digital technologies in professional interactions with colleagues, learners, parents and other interested parties, for their own individual professional development and for the collective good of the organisation. Areas 6 details the specific pedagogic competences required to facilitate students' digital competence.

Both areas acknowledge that educators' digital competence goes beyond the concrete use of digital technologies within teaching and learning. Digitally competent educators must also consider the overall environment, in which teaching and learning encounters are embedded. Hence, it is part of educators' digital competence to enable learners to actively participate in life and work in a digital age. It is also part of their competence to reap the benefits of digital technologies for enhancing pedagogic practice and organisational strategies.

DigCompEdu

explained

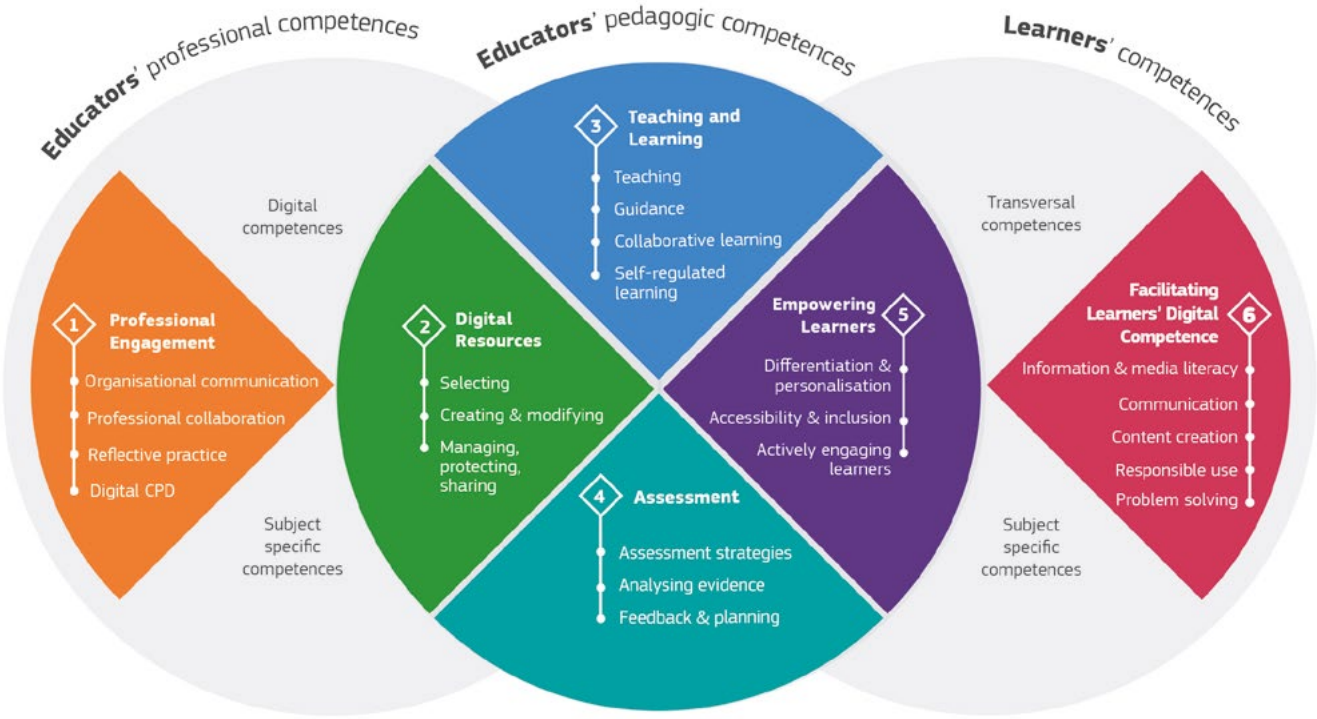


FIGURE 4: SYNTHESIS OF THE DIGCOMPEDU FRAMEWORK

01 Professional Engagement

Educators' digital competence is expressed in their ability to use digital technologies not only to enhance teaching, but also for their professional interactions with colleagues, learners, parents and other interested parties, for their individual professional development and for the collective good and continuous innovation in the organisation and the teaching profession. This is the focus of Area 1.

Professional Engagement

Organisational communication

To use digital technologies to enhance organisational communication with learners, parents and third parties. To contribute to collaboratively developing and improving organisational communication strategies.

Professional collaboration

To use digital technologies to engage in collaboration with other educators, sharing and exchanging knowledge and experience, and collaboratively innovating pedagogic practices.

Reflective practice

To individually and collectively reflect on, critically assess and actively develop one's own digital pedagogical practice and that of one's educational community.

Digital Continuous Professional Development (CPD)

To use digital sources and resources for continuous professional development.

TABLE 1: AREA 1 – PROFESSIONAL ENGAGEMENT

02 Digital Resources

Educators are currently confronted with a wealth of digital (educational) resources they can use for teaching. One of the key competences any educator needs to develop is to come to terms with this variety, to effectively identify resources that best fit their learning objectives, learner group and teaching style, to structure the wealth of materials, establish connections and to modify, add on to and develop themselves digital resources to support their teaching.

At the same time they need to be aware of how to responsibly use and manage digital content. They must respect copyright rules when using, modifying and sharing resources, and protect sensitive content and data, such as digital exams or students' grades.

Digital Resources

Selecting digital resources

To identify, assess and select digital resources for teaching and learning. To consider the specific learning objective, context, pedagogical approach, and learner group, when selecting digital resources and planning their use.

Creating and modifying digital resources

To modify and build on existing openly-licensed resources and other resources where this is permitted. To create or co-create new digital educational resources. To consider the specific learning objective, context, pedagogical approach, and learner group, when designing digital resources and planning their use.

Managing, protecting and sharing digital resources

To organise digital content and make it available to learners, parents and other educators. To effectively protect sensitive digital content. To respect and correctly apply privacy and copyright rules. To understand the use and creation of open licenses and open educational resources, including their proper attribution.

TABLE 2: AREA 2 – DIGITAL RESOURCES

03 Teaching and Learning

Digital technologies can enhance and improve teaching and learning strategies in many different ways. However, whatever pedagogic strategy or approach is chosen, the educator's specific digital competence lies in effectively orchestrating the use of digital technologies in the different phases and settings of the learning process. The fundamental competence in this area – and maybe of the whole framework - is 3.1: Teaching. This competence refers to designing, planning and implementing the use of digital technologies in the different stages of the learning process.

Competences 3.2 to 3.4 complement this competence by emphasizing that the real potential of digital technologies lies in shifting the focus of the teaching process from teacher-led to learner-centred processes. Thus the role of a digitally-competent educator is to be a mentor and guide for learners in their progressively more autonomous learning endeavours. In this sense, digitally-competent educators need to be able to design new ways, supported by digital technologies, to provide guidance and support to learners, individually and collectively (3.2) and to initiate, support and monitor both self-regulated (3.4) and collaborative (3.3) learning activities.

Teaching and Learning

Teaching

To plan for and implement digital devices and resources in the teaching process, so as to enhance the effectiveness of teaching interventions. To appropriately manage and orchestrate digital teaching strategies. To experiment with and develop new formats and pedagogical methods for instruction.

Guidance

To use digital technologies and services to enhance the interaction with learners, individually and collectively, within and outside the learning session. To use digital technologies to offer timely and targeted guidance and assistance. To experiment with and develop new forms and formats for offering guidance and support.

Collaborative learning

To use digital technologies to foster and enhance learner collaboration. To enable learners to use digital technologies as part of collaborative assignments, as a means of enhancing communication, collaboration and collaborative knowledge creation.

Self-regulated learning

To use digital technologies to support learners' self-regulated learning, i.e. to enable learners to plan, monitor and reflect on their own learning, provide evidence of progress, share insights and come up with creative solutions.

TABLE 3: AREA 3 - TEACHING AND LEARNING

04 Assessment

Assessment can be a facilitator or bottleneck to innovation in education. When integrating digital technologies into learning and teaching, we must consider how digital technologies can enhance existing assessment strategies. At the same time, we must also consider how they can be used to create or to facilitate innovative assessment approaches. Digitally-competent educators should be able to use digital technologies within assessment with those two objectives in mind.

Furthermore, the use of digital technologies in education, whether for assessment, learning, administrative or other purposes, results in a wide range of data being available on each individual learner's learning behaviour. Analysing and interpreting this data and using it to help make decisions is becoming more and more important – complemented by the analysis of conventional evidence on learner behaviour.

At the same time, digital technologies can contribute to directly monitoring learner progress, to facilitating feedback and to allowing educators to assess and adapt their teaching strategies.

Assessment

Assessment strategies

To use digital technologies for formative and summative assessment. To enhance the diversity and suitability of assessment formats and approaches.

Analysing evidence

To generate, select, critically analyse and interpret digital evidence on learner activity, performance and progress, in order to inform teaching and learning.

Feedback and planning

To use digital technologies to provide targeted and timely feedback to learners. To adapt teaching strategies and to provide targeted support, based on the evidence generated by the digital technologies used. To enable learners and parents to understand the evidence provided by digital technologies and use it for decision-making.

TABLE 4: AREA 4 - DIGITAL ASSESSMENT

05 Empowering Learners

One of the key strengths of digital technologies in education is their potential for supporting learner-centred pedagogic strategies and boosting the active involvement of learners in the learning process and their ownership of it. Thus, digital technologies can be used to facilitate learners' active engagement, e.g. when exploring a topic, experimenting with different options or solutions, understanding connections, coming up with creative solutions or creating an artefact and reflecting on it.

Digital technologies can furthermore contribute to supporting classroom differentiation and personalised education by offering learning activities adapted to each individual learner's level of competence, interests and learning needs. At the same time, however, care must be taken not to exacerbate existing inequalities (e.g. in access to digital technologies or digital skills) and to ensure accessibility for all learners, including those with special educational needs.

Empowering Learners

Accessibility and inclusion

To ensure accessibility to learning resources and activities, for all learners, including those with special needs. To consider and respond to learners' (digital) expectations, abilities, uses and misconceptions, as well as contextual, physical or cognitive constraints to their use of digital technologies.

Differentiation and personalisation

To use digital technologies to address learners' diverse learning needs, by allowing learners to advance at different levels and speeds, and to follow individual learning pathways and objectives.

Actively engaging learners

To use digital technologies to foster learners' active and creative engagement with a subject matter. To use digital technologies within pedagogic strategies that foster learners' transversal skills, deep thinking and creative expression. To open up learning to new, real-world contexts, which involve learners themselves in hands-on activities, scientific investigation or complex problem solving, or in other ways increase learners' active involvement in complex subject matters.

TABLE 5: AREA 5 – EMPOWERING LEARNERS

06 Facilitating Learners' Digital Competence

Digital competence is one of the transversal competences educators need to instil in learners. Whereas fostering other transversal competences is only part of educators' digital competence in as far as digital technologies are used to do so, the ability to facilitate learners' digital competence is an integral part of educators' digital competence. Because of this, this ability merits a dedicated area in the DigCompEdu framework

Learners' digital competence is captured by the European Digital Competence Framework for Citizens (DigComp). Thus, the DigCompEdu area follows the same logic and details five competences aligned in content and description with DigComp. The headlines, however, have been adapted to emphasize the pedagogical dimension and focus within this framework.

Facilitating Learners' Digital Competence

Information and media literacy

To incorporate learning activities, assignments and assessments which require learners to articulate information needs; to find information and resources in digital environments; to organise, process, analyse and interpret information; and to compare and critically evaluate the credibility and reliability of information and its sources.

Digital communication and collaboration

To incorporate learning activities, assignments and assessments which require learners to effectively and responsibly use digital technologies for communication, collaboration and civic participation.

Digital content creation

To incorporate learning activities, assignments and assessments which require learners to express themselves through digital means, and to modify and create digital content in different formats. To teach learners how copyright and licenses apply to digital content, how to reference sources and attribute licenses.

Responsible use

To take measures to ensure learners' physical, psychological and social wellbeing while using digital technologies. To empower learners to manage risks and use digital technologies safely and responsibly.

Digital problem solving

To incorporate learning activities, assignments and assessments which require learners to identify and solve technical problems, or to transfer technological knowledge creatively to new situations.

TABLE 6: AREA 6 – FACILITATING LEARNERS' DIGITAL COMPETENCE

07 Overview

1. Professional Engagement

1.1 Organisational communication
To use digital technologies to enhance organisational communication with learners, parents and third parties. To contribute to collaboratively developing and improving organisational communication strategies.

1.2 Professional collaboration
To use digital technologies to engage in collaboration with other educators, sharing and exchanging knowledge and experiences and collaboratively innovating pedagogic practices.

1.3 Reflective practice
To individually and collectively reflect on, critically assess and actively develop one's own digital pedagogical practice and that of one's educational community.

1.4 Digital Continuous Professional Development (CPD)
To use digital sources and resources for continuous professional development.

2. Digital Resources

2.1 Selecting digital resources
To identify, assess and select digital resources for teaching and learning. To consider the specific learning objective, context, pedagogical approach, and learner group, when selecting digital resources and planning their use.

2.2 Creating and modifying digital resources
To modify and build on existing openly-licensed resources and other resources where this is permitted. To create or co-create new digital educational resources. To consider the specific learning objective, context, pedagogical approach, and learner group, when designing digital resources and planning their use.

2.3 Managing, protecting and sharing digital resources
To organise digital content and make it available to learners, parents and other educators. To effectively protect sensitive digital content. To respect and correctly apply privacy and copyright rules. To understand the use and creation of open licenses and open educational resources, including their proper attribution.

3. Teaching and Learning

3.1 Teaching
To plan for and implement digital devices and resources in the teaching process, so as to enhance the effectiveness of teaching interventions. To appropriately manage and orchestrate digital teaching interventions. To experiment with and develop new formats and pedagogical methods for instruction.

3.2 Guidance
To use digital technologies and services to enhance the interaction with learners, individually and collectively, within and outside the learning session. To use digital technologies to offer timely and targeted guidance and assistance. To experiment with and develop new forms and formats for offering guidance and support.

3.3 Collaborative learning
To use digital technologies to foster and enhance learner collaboration. To enable learners to use digital technologies as part of collaborative assignments, as a means of enhancing communication, collaboration and collaborative knowledge creation.

3.4 Self-regulated learning
To use digital technologies to support self-regulated learning processes, i.e. to enable learners to plan, monitor and reflect on their own learning, provide evidence of progress, share insights and come up with creative solutions.

4. Assessment

4.1 Assessment strategies
To use digital technologies for formative and summative assessment. To enhance the diversity and suitability of assessment formats and approaches.

4.2 Analysing evidence
To generate, select, critically analyse and interpret digital evidence on learner activity, performance and progress, in order to inform teaching and learning.

4.3 Feedback and planning
To use digital technologies to provide targeted and timely feedback to learners. To adapt teaching strategies and to provide targeted support, based on the evidence generated by the digital technologies used. To enable learners and parents to understand the evidence provided by digital technologies and use it for decision-making.

5. Empowering Learners

5.1 Accessibility and inclusion
To ensure accessibility to learning resources and activities, for all learners, including those with special needs. To consider and respond to learners' (digital) expectations, abilities, uses and misconceptions, as well as contextual, physical or cognitive constraints to their use of digital technologies.

5.2 Differentiation and personalisation
To use digital technologies to address learners' diverse learning needs, by allowing learners to advance at different levels and speeds, and to follow individual learning pathways and objectives.

5.3 Actively engaging learners
To use digital technologies to foster learners' active and creative engagement with a subject matter. To use digital technologies within pedagogic strategies that foster learners' transversal skills, deep thinking and creative expression. To open up learning to new, real-world contexts, which involve learners themselves in hands-on activities, scientific investigation or complex problem solving, or in other ways increase learners' active involvement in complex subject matters.

6. Facilitating Learners' Digital Competence

6.1 Information and media literacy
To incorporate learning activities, assignments and assessments which require learners to articulate information needs; to find information and resources in digital environments; to organise, process, analyse and interpret information; and to compare and critically evaluate the credibility and reliability of information and its sources.

6.2 Digital communication & collaboration
To incorporate learning activities, assignments and assessments which require learners to effectively and responsibly use digital technologies for communication, collaboration and civic participation.

6.3 Digital content creation
To incorporate learning activities, assignments and assessments which require learners to express themselves through digital means, and to modify and create digital content in different formats. To teach learners how copyright and licenses apply to digital content, how to reference sources and attribute licenses.

6.4. Responsible use
To take measures to ensure learners' physical, psychological and social wellbeing while using digital technologies. To empower learners to manage risks and use digital technologies safely and responsibly.

6.5 Digital problem solving
To incorporate learning activities, assignments and assessments which require learners to identify and solve technical problems, or to transfer technological knowledge creatively to new situations.

TABLE 7: OVERVIEW OF DIGCOMPEDU FRAMEWORK

DigCompEdu

in detail

How can educators develop their digital competence?

This chapter describes more in depth what it means for educators to be digitally competent. For each of the 22 elementary competences, the competence descriptor is complemented by a list of typical activities. A progression model along six levels is proposed, for which a rubric with proficiency statements for self-assessment is supplied.

Terminology

Competence descriptor

The title and a short description. The short description may consist of one or several sentences. It aims to concisely and comprehensively describe the competence in question. This description is the main reference. Any activity that can be subsumed under this description should be considered an expression of this competence. Any activity that falls outside of the descriptions' scope is not part of this competence.

Activities

A list of activities that are examples of this competence. This list serves to indicate to framework users what kinds of activities are covered by the competence in question. However, this list is not exhaustive: it illustrates the focus and scope of the competence, without delimiting it. Furthermore, as digital technologies and usage patterns evolve, some of the activities listed may cease to be applicable and others may need to be added.

Progression

A generic description of how this competence manifests itself at different proficiency levels. The progression is cumulative in the sense that each higher-level descriptor comprises all lower-level descriptors. The progression follows the logic inherent in the competence in question, which may be different from that of other competences.

Proficiency statements

A series of proficiency statements exemplifying typical activities at each proficiency level. This list of statements is subject to continuous revision and should only be considered as a means of illustrating the proficiency progression. Since the progression of proficiency levels is cumulative, a person competent at an advanced level should be able to perform the activities at this level and all lower levels, with the exception of the lowest level (A1).

Digital technologies

Throughout the tables the concept of "digital technologies" is employed as an umbrella term for digital resources and devices, thus comprising any kind of digital input: software (including apps and games), hardware (e.g. classroom technologies or mobile devices) or digital content/data (i.e. any files, including images, audio and video). For more detailed information on the terminology used in this report, please refer to the glossary.

Progression model

The proposed progression model is intended to help educators understand their personal strengths and weaknesses, by describing different stages or levels of digital competence development. For ease of reference, these competence stages are linked to the six proficiency levels used by the Common European Framework of Reference for Languages (CEFR), ranging from A1 to C2.

There are several advantages to using the CEFR taxonomy: Since the CEFR levels are widely known and used, it is easy for educators to understand and appreciate their personal level of digital competence. Furthermore, the use of these established levels gives coherence to European frameworks. From a practical point of view this means that, when stating their level of educator-specific digital competence in their CV, educators can refer to the same levels as for their language competence. More importantly, since educators know that their language competence levels may differ when comparing, e.g., their listening, speaking and writing skills, it will be natural for them to accept that their digital competence has to be appreciated by area and may differ widely from one area to another. This will make it easier for them to concentrate on their specific development needs. Finally, from a conceptual point of view, CEFR organises the six levels in three blocks, which reflects the fact that while the levels A1 and A2, B1 and B2 and C1 and C2 are closely related, there is a cognitive leap between A2 and B1 and B2 and C1 respectively. This is also true for the DigCompEdu competence progression.

However, the great disadvantage of these levels is that they could be perceived as threatening. The main objective of the proposed DigCompEdu progression model is to support continuous professional development. It is not intended as a normative framework or as a tool for performance appraisal. On the contrary, the 22 competences are explained in six stages to inform educators about where they stand, what they already have achieved and what would be the next steps if they want to further develop this specific competence. The proficiency statements are designed to celebrate achievements and to encourage educators to develop their competences, by indicating small steps that will eventually, step by step, increase their confidence and competence. The main idea of the proficiency progression is to make explicit the different stages through which each elementary competence usually develops, so as to help educators identify and decide on the specific measures to take to boost their competence at the stage they are currently at.

Thus, to encourage educators to use the DigCompEdu framework as a tool for their professional development, it was decided to couple CEFR levels with motivating role descriptors, ranging from *Newcomer (A1)* to *Pioneer (C2)*. These descriptors are intended motivate educators at all levels to positively appreciate their achievements and to look forward to expanding them further.

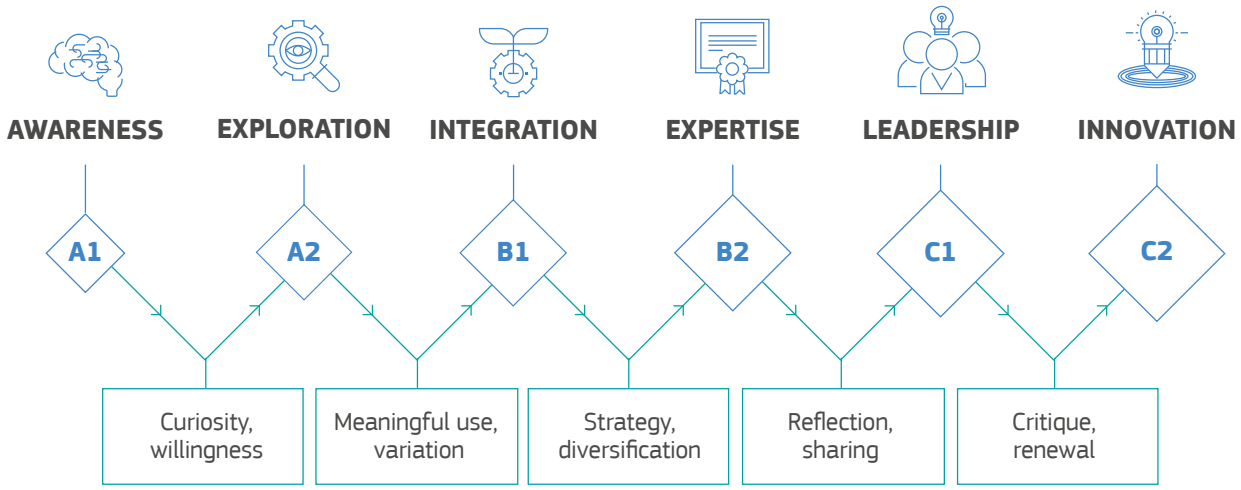


FIGURE 5: DIGCOMPEDU PROGRESSION MODEL

These stages and the logic of their progression are inspired by Bloom's revised taxonomy[1]. It is widely accepted that this taxonomy explains the subsequent cognitive stages of any learning progress well, from "Remembering" and "Understanding", to "Applying" and "Analysing", and finally to "Evaluating" and "Creating". Similarly, in the first two stages of DigCompEdu, *Newcomer (A1)* and *Explorer (A2)*, educators assimilate new information and develop basic digital practices; at the following two stages, *Integrator (B1)* and *Expert (B2)*, educators apply, further expand and reflect on their digital practices; at the highest stages, *Leader (C1)* and *Pioneer (C2)*, educators pass on their knowledge, critique existing practice and develop new practices.

The labels for each competence level were selected to capture the particular focus of digital technology use typical for the competence stage. For example, to be at, say, *Integrator (B1)* level as concerns teaching practices (Area 3), means that the educator's current competence development focus is on integrating a range of digital technologies in teaching and learning. It implies that the next step for this person's digital competence development would be to move to the *Expert (B2)* phase, i.e. to gain more confidence, to better understand what works, when and why, and to be able to find suitable and innovative solutions, including ones for tricky situations.

In this sense, the descriptors also relate to an educator's relative strengths and roles within a professional community. For example, within a team of educators collaborating on a project, an *Integrator (B1)* is ideally suited to sourcing new ideas and tools, whereas the colleague at *Expert (B2)* level may be better at deciding how to go about implementing these; the colleague at *Explorer (A2)* level can best identify the possible problems learners may encounter in the use of the digital technologies involved, and the role of the *Leader (C1)* or *Pioneer (C2)* of the team would be to shape the project so as to seize the innovative potential of digital technologies in enhancing learning and empowering learners.

1. Anderson, L.W., and D. Krathwohl (Eds.) (2001). A Taxonomy for Learning, Teaching and Assessing: a Revision of Bloom's Taxonomy of Educational Objectives. Longman, New York.

Proficiency levels

In general, the following characterisations apply to the different competence stages:

Newcomer (A1):

Newcomers are aware of the potential of digital technologies for enhancing pedagogical and professional practice. However, they have had very little contact with digital technologies and use them mainly for lesson preparation, administration or organisational communication. Newcomers need guidance and encouragement to expand their repertoire and to apply their existing digital competence in the pedagogical realm.

Explorer (A2):

Explorers are aware of the potential of digital technologies and are interested in exploring them to enhance pedagogical and professional practice. They have started using digital technologies in some areas of digital competence, without, however, following a comprehensive or consistent approach. Explorers need encouragement, insight and inspiration, e.g. through the example and guidance of colleagues, embedded in a collaborative exchange of practices.

Integrator (B1):

Integrators experiment with digital technologies in a variety of contexts and for a range of purposes, integrating them into many of their practices. They creatively use them to enhance diverse aspects of their professional engagement. They are eager to expand their repertoire of practices. They are, however, still working on understanding which tools work best in which situations and on fitting digital technologies to pedagogic strategies and methods. Integrators just need some more time for experimentation and reflection, complemented by collaborative encouragement and knowledge exchange to become *Experts*.

Expert (B2):

Experts use a range of digital technologies confidently, creatively and critically to enhance their professional activities. They purposefully select digital technologies for particular situations, and try to understand the benefits and drawbacks of different digital strategies. They are curious and open to new ideas, knowing that there are many things they have not tried out yet. They use experimentation as a means of expanding, structuring and consolidating their repertoire of strategies. Experts are the backbone of any educational organisation when it comes to innovating practice.

Leader (C1):

Leaders have a consistent and comprehensive approach to using digital technologies to enhance pedagogic and professional practices. They rely on a broad repertoire of digital strategies from which they know how to choose the most appropriate for any given situation. They continuously reflect on and further develop their practices. Exchanging with peers, they keep updated on new developments and ideas. They are a source of inspiration for others, to whom they pass on their expertise.

Pioneer (C2):

Pioneers question the adequacy of contemporary digital and pedagogical practices, of which they themselves are *Leaders*. They are concerned about the constraints or drawbacks of these practices and driven by the impulse to innovate education even further. Pioneers experiment with highly innovative and complex digital technologies and/or develop novel pedagogical approaches. Pioneers are a unique and rare species. They lead innovation and are a role model for younger teachers.

For all competences, the progression of proficiency levels is cumulative in the sense that each higher level descriptor comprises all lower level descriptors, with the exception of the first level, *Newcomer (A1)*. E.g., to be an *Expert (B2)* means to be able to subscribe to all statements at levels A2 to B2, but not to those at C1 and C2 level. The *Newcomer (A1)* level is largely described by the absence of certain competences, i.e. knowledge, skills or attitudes, present at the A2 or higher levels. Thus, *Explorers (A2)* are those who have overcome the concerns or doubts present at the *Newcomer (A1)* level.

For each competence a specific progression applies, depending on the characteristics of the competence in question and the way it typically evolves as a higher level of proficiency is obtained. However, some key words are common to the same level of proficiency across the competences of one area. These are indicated in Table 8.

TABLE 8: DIGCOMPEDU PROFICIENCY PROGRESSION BY AREA

01

Professional Engagement

Organisational communication

To use digital technologies to enhance organisational communication with learners, parents and third parties. To contribute to collaboratively developing and improving organisational communication strategies.

Activities

- To use digital technologies to make additional learning resources and information available to learners (and parents).
- To use digital technologies to communicate organisational procedures to learners and parents, e.g. rules, appointments, events.
- To use digital technologies to inform learners and parents on an individual basis, e.g. on progress and issues of concern.
- To use digital technologies to communicate with colleagues in the same organisation and beyond.
- To use digital technologies to communicate with third parties relevant to the educational project, e.g. experts to be invited, places to be visited.
- To communicate via the organisation's website or through corporate digital technologies, platforms or communication services contracted.
- To contribute with content to the organisation's website or virtual learning environment.
- To contribute to collaboratively developing and improving organisational communication strategies.

Progression		Proficiency statements
Newcomer (A1) 	Making **little use** of digital technologies for communication.	I rarely use digital technologies for communication.
Explorer (A2) 	Being **aware** and making **basic use** of digital technologies for communication.	I make use of digital technologies for communication e.g. with learners, parents, colleagues or support staff.
Integrator (B1) 	Using digital technologies for communication in an **effective** and **responsible** way.	I use different digital communication channels and tools, depending on the communication purpose and context. I communicate responsibly and ethically with digital technologies, e.g. respecting netiquette and acceptable use policies (AUP).
Expert (B2) 	Using digital technologies for communication in a **structured** and **responsive** way.	I select the most appropriate channel, format and style for a given communication purpose and context. I adapt my communication strategies to the specific audience.
Leader (C1) 	**Evaluating** and **discussing** communication strategies.	I evaluate, reflect on and collaboratively discuss how digital technologies are used effectively for organisational and individual communication. I use digital technologies to make administrative procedures more transparent for learners and/or parents and to allow them to make informed choices on future learning priorities.
Pioneer (C2) 	Reflecting on and **re-designing** communication strategies.	I contribute to developing a coherent vision or strategy on using digital technologies effectively and responsibly for communication.

Professional collaboration

To use digital technologies to engage in collaboration with other educators, sharing and exchanging knowledge and experience, and collaboratively innovating pedagogic practices.

Activities

- To use digital technologies to collaborate with other educators, on a dedicated project or task.
- To use digital technologies to share and exchange knowledge, resources and experiences with colleagues and peers.
- To use digital technologies to collaboratively develop educational resources.
- To use professional collaborative networks to explore and reflect on new pedagogic practices and methods.
- To use professional collaborative networks as a source for one's own professional development.

Progression		Proficiency statements
Newcomer (A1) 	Making **little use** of digital technologies for collaboration.	I rarely use digital technologies to collaborate with colleagues.
Explorer (A2) 	Being aware and making **basic use** of digital technologies for collaboration.	I use digital technologies to collaborate with colleagues in my organisation, e.g. on a dedicated joint project, or to exchange content, knowledge and opinions.
Integrator (B1) 	Using digital technologies to **share** and **exchange** practice.	I use digital communities to explore new pedagogic resources or methods and to get fresh ideas. I use digital technologies to share and exchange the resources I use, my knowledge and opinion, with colleagues within and beyond my organisation.
Expert (B2) 	Using digital technologies for **collaborative knowledge construction.**	I actively use digital communities to exchange ideas and collaboratively develop digital resources.
Leader (C1) 	Using digital technologies for **reflecting on** and **enhancing** practices and competences.	I use the insight and resources, generated in the collaborative networks I belong to, to get feedback on and improve my competences, and to expand my repertoire of digital practices.
Pioneer (C2) 	Using digital technologies to **facilitate innovative practice.**	I use digital communities to help other educators develop their digital and pedagogic competences. I use digital communities to collaborate with peers on innovating pedagogical practices.

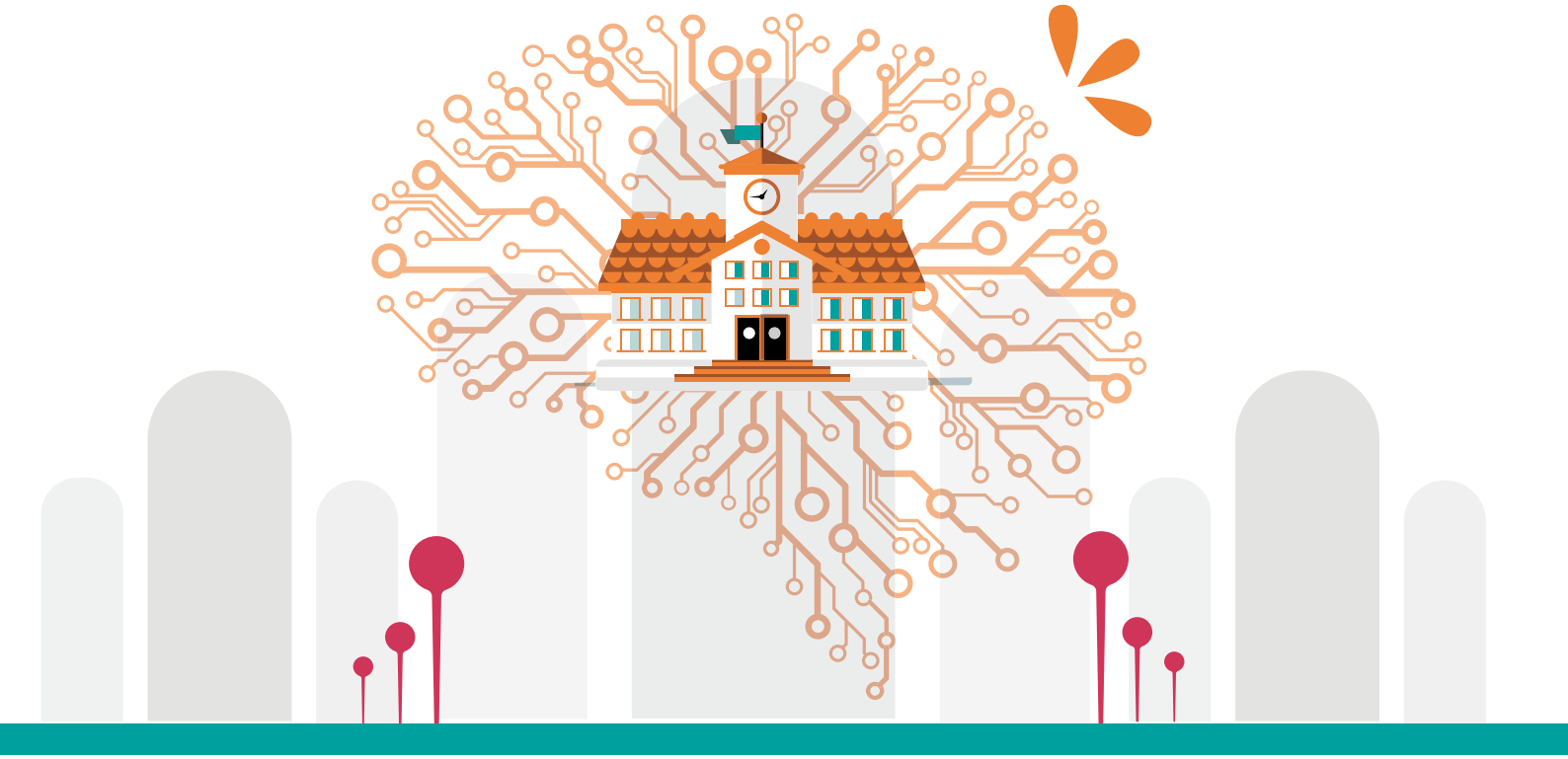
Reflective practice

To individually and collectively reflect on, critically assess and actively develop one's own digital pedagogical practice and that of one's educational community.

Activities

- To critically reflect on one's own digital and pedagogic practice.
- To identify competence gaps and areas for improvement.
- To seek the help of others in improving one's digital and pedagogical practice.
- To seek targeted training and use opportunities for continuous professional development.
- To seek to continuously expand and enhance one's repertoire of digital pedagogical practices.
- To help others in developing their digital pedagogical competence.
- At the organisational level, to reflect on and provide critical feedback on digital policies and practices.
- To actively contribute to further developing organisational practices, policies and visions on the use of digital technologies.

Progression		Proficiency statements
Newcomer (A1) 	**Being unsure** about one's development needs.	I know that I need to enhance my digital skills, but I am unsure how and where to start.
Explorer (A2) 	**Being aware of** one's development needs.	I am aware of the limits of my own digital competence and my training needs.
Integrator (B1) 	**Using experimentation** and **peer learning** as a source for development.	I seek to improve and update my digital pedagogical competence through experimentation and peer-learning. I creatively experiment with and reflect on new pedagogical approaches, enabled by digital technologies.
Expert (B2) 	Using a range of resources to develop one's **individual** digital and pedagogic practices.	I actively seek out best practices, courses or other advice to improve my own digital pedagogies and wider digital competences. I evaluate, reflect on and discuss with peers how to use digital technologies to innovate and improve educational practice.
Leader (C1) 	Collaboratively reflecting on and enhancing **pedagogic practice in general.**	I follow current research on innovative teaching and integrate research findings into my practice. I evaluate, reflect on and collaboratively discuss policy and organisational practice concerning the use of digital technologies. I help peers in developing their digital competence.
Pioneer (C2) 	**Innovating** educational policies and practices.	I develop, individually or in collaboration with peers, a vision or strategy for improving educational practice through the use of digital technologies. I reflect on and evaluate with colleagues and/or researchers different digital practices, methods and policies, with a view to developing innovative methods.



Digital Continuous Professional Development (CPD)

To use digital sources and resources for continuous professional development.

Activities

- To use the internet to identify suitable training and professional development opportunities.
- To use the internet to update one's subject-specific competences.
- To use the internet to learn about new pedagogical methods and strategies.
- To use the internet to search for and identify digital resources which support professional development.
- To use the exchange in digital professional communities as a source of professional development.
- To use online training opportunities, e.g. video tutorials, MOOCs, webinars etc.
- To use digital technologies and environments to provide training opportunities for colleagues and peers.

Progression		Proficiency statements
Newcomer (A1) 	Making **little use** of the internet for updating knowledge.	I only rarely, if at all, use the internet to update my knowledge or skills.
Explorer (A2) 	Using the internet for **updating knowledge.**	I use the internet to update my subject-specific or pedagogical knowledge.
Integrator (B1) 	Using the internet to **identify opportunities** for CPD.	I use the internet to identify suitable training courses and other opportunities for professional development (e.g. conferences).
Expert (B2) 	**Exploring online CPD** opportunities.	I use the internet for professional development, e.g. by participating in online courses, webinars, or consulting digital training materials and video tutorials. I use formal and informal exchanges in professional online communities as a source for my professional development.
Leader (C1) 	**Critically** and **strategically** using the internet for **CPD.**	I consult a range of possible online training opportunities and select those which best fit my development needs, learning style and time constraints. I actively participate in online training opportunities and contribute to improving them and guiding others in making appropriate choices by providing feedback.
Pioneer (C2) 	Using the internet to **provide CPD to peers.**	I use digital technologies to advise peers on innovative teaching practices, e.g. in professional communities, through personal blogs, or by developing digital training materials for them.

02

Digital Resources

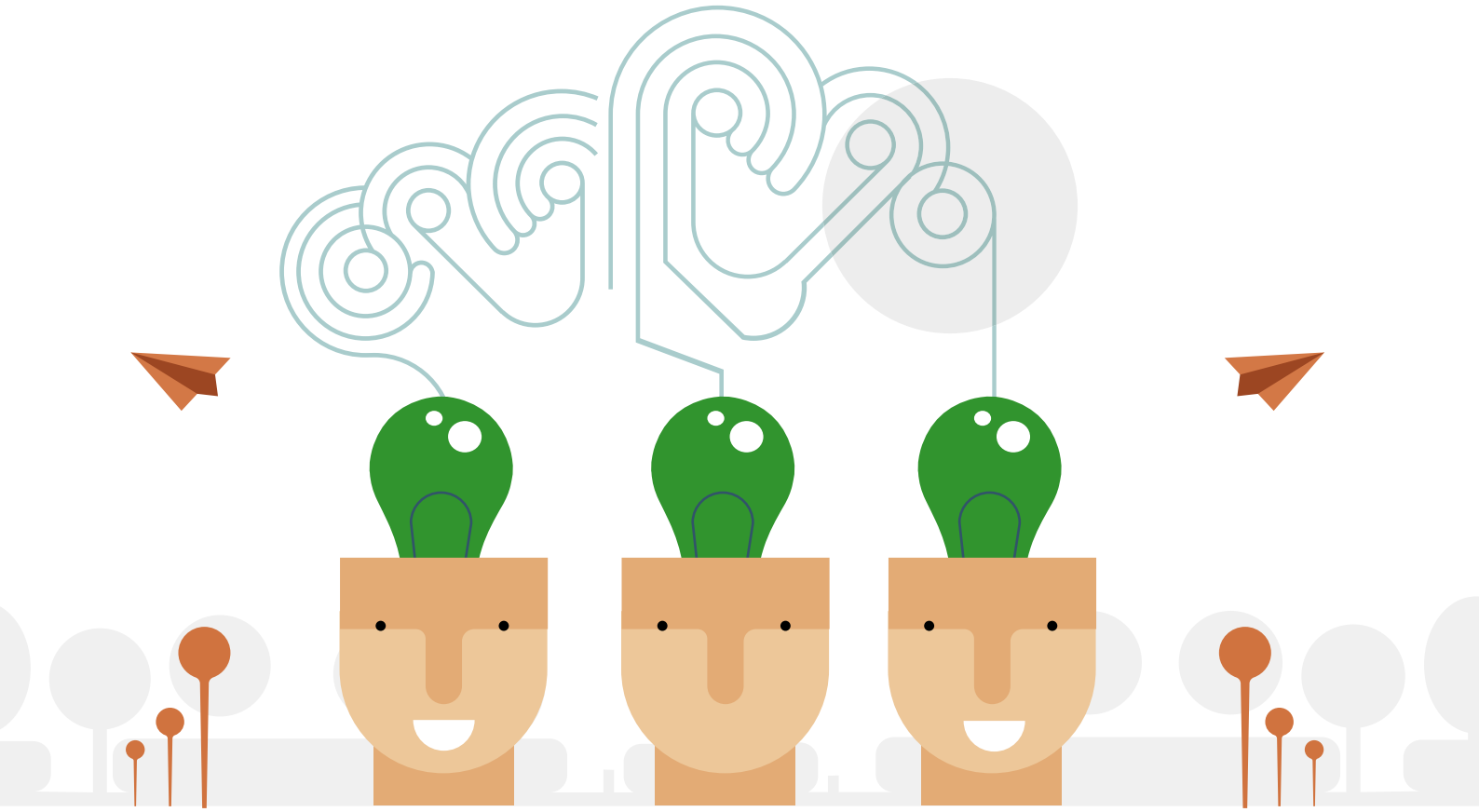
Selecting digital resources

To identify, assess and select digital resources to support and enhance teaching and learning. To consider the specific learning objective, context, pedagogical approach, and learner group, when selecting digital resources and planning their use.

Activities

- To formulate appropriate search strategies to identify digital resources for teaching and learning.
- To select suitable digital resources for teaching and learning, considering the specific learning context and learning objective.
- To critically evaluate the credibility and reliability of digital sources and resources.
- To consider possible restrictions to the use or re-use of digital resources (e.g. copyright, file type, technical requirements, legal provisions, accessibility).
- To assess the usefulness of digital resources in addressing the learning objective, the competence levels of the concrete learner group as well as the pedagogic approach chosen.

Progression		Proficiency statements
Newcomer (A1) 	Making **little use** of the internet to find resources.	I only rarely, if at all, use the internet to find resources for teaching and learning.
Explorer (A2) 	Being aware and making basic use of digital technologies for **finding resources.**	I use simple internet search strategies to identify digital content relevant for teaching and learning. I am aware of common educational platforms which provide educational resources.
Integrator (B1) 	Identifying and **assessing** suitable resources using **basic criteria.**	I adapt my search strategies based on the results I obtain. I filter results to find suitable resources, using appropriate criteria. I evaluate the quality of digital resources based on basic criteria, such as e.g. place of publication, authorship, other users' feedback. I select resources that my learners may find appealing, e.g. videos.
Expert (B2) 	Identifying and **assessing** suitable resources using **complex criteria.**	I adapt my search strategies to identify resources which I can modify and adapt, e.g. searching and filtering by license, filename extension, date, user feedback etc. I locate apps and/or games for my learners to use. I evaluate the reliability of digital resources and their suitability for my learner group and specific learning objective. I give feedback and recommendations on the resources I use.
Leader (C1) 	**Comprehensively** identifying and assessing suitable resources, considering all relevant aspects.	In addition to search engines, I use a variety of other sources, e.g. collaborative platforms, official repositories, etc. I evaluate the reliability and suitability of content based on a combination of criteria, verifying also its accuracy and neutrality. When I use resources in class, I contextualise them for the students, e.g. by pointing out their source and potential bias.
Pioneer (C2) 	**Promoting** the use of digital resources in education.	I provide guidance to colleagues on effective search strategies and suitable repositories and resources. I set up my own repository of (links to) resources, appropriately annotated and rated, and make it available for other colleagues to use.



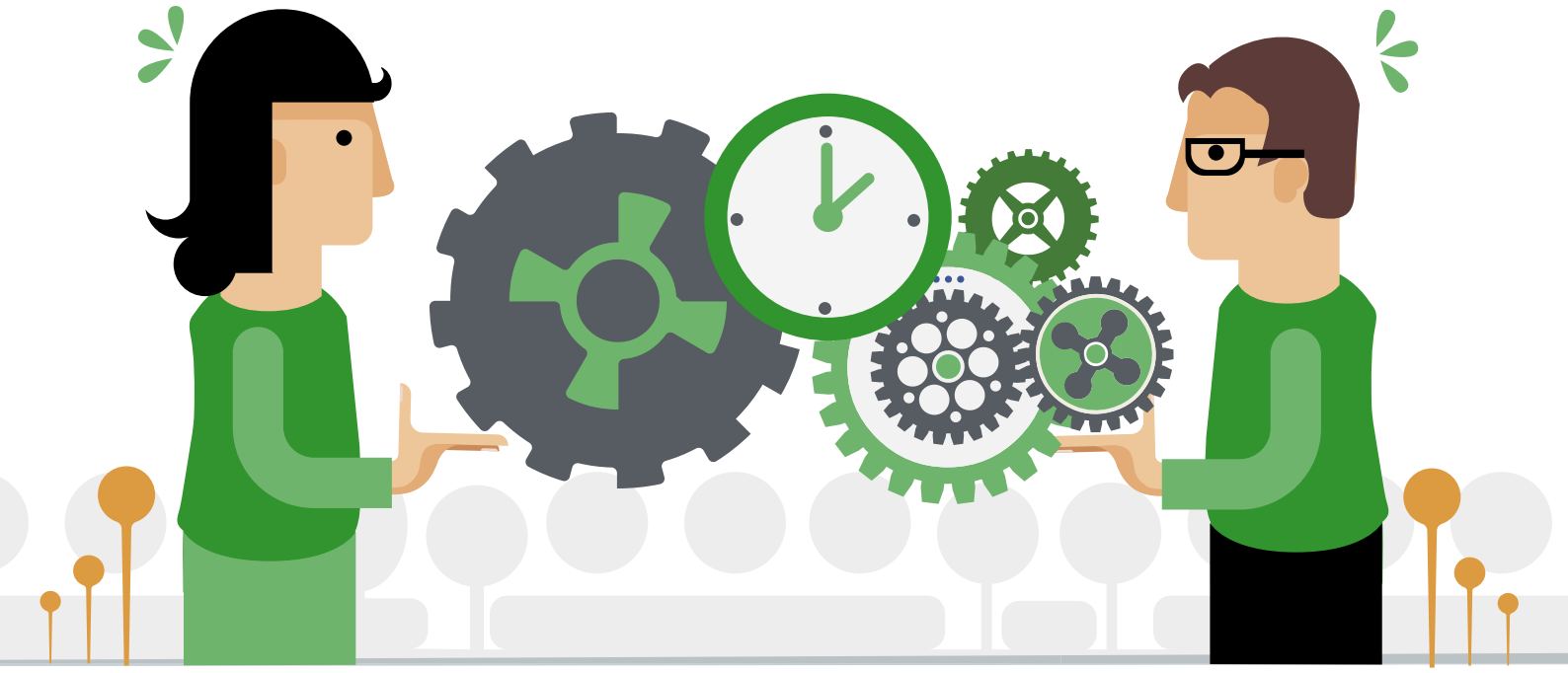
Creating and modifying digital resources

To modify and build on existing openly-licensed resources and other resources where this is permitted. To create or co-create new digital educational resources. To consider the specific learning objective, context, pedagogical approach, and learner group, when designing digital resources and planning their use.

Activities

- To modify and edit existing digital resources, where this is permitted.
- To combine and mix existing digital resources or parts thereof, where this is permitted.
- To create new digital educational resources.
- To jointly create with others digital educational resources.
- To consider the specific learning objective, context, pedagogical approach, and learner group, when adapting or creating digital learning resources.
- To understand different licences attributed to digital resources and the implications for their re-use.

Progression		Proficiency statements
Newcomer (A1) 	**Refraining** from modifying digital resources.	I may make use of digital resources, but I do not usually modify them or create my own resources.
Explorer (A2) 	Creating and modifying resources using **basic tools** and strategies.	I use office software to design and modify e.g. worksheets and quizzes. I create digital presentations for instructional purposes.
Integrator (B1) 	Creating and modifying resources using **some advanced features.**	When I create digital resources (e.g. presentations), I integrate some animations, links, multimedia or interactive elements. I make some basic modifications to the digital learning resources I use to fit them to the learning context, e.g. editing or deleting parts, adapting the general settings. I address a specific learning objective when selecting, modifying, combining and creating digital learning resources.
Expert (B2) 	Adapting **advanced digital resources** to a concrete learning context.	I integrate a range of interactive elements and games into my self-created instructional resources. I modify and combine existing resources to create learning activities that are tailored to a concrete learning context and objective, and to the characteristics of the learner group. I understand different licenses attributed to digital resources and know the permissions granted to me as regards modifying resources.
Leader (C1) 	Creating, co-creating and modifying resources according to the **learning context**, using a **range of advanced strategies.**	I create and modify complex and interactive digital learning activities, e.g. interactive worksheets, online assessments, online collaborative learning activities (e.g. wikis, blogs), games, apps, visualisations. I co-create learning resources with colleagues.
Pioneer (C2) 	Creating **complex, interactive** digital resources.	I create my own apps or games to support my educational objectives.



Managing, protecting and sharing digital resources

To organise digital content and make it available to learners, parents and other educators. To effectively protect sensitive digital content. To respect and correctly apply privacy and copyright rules. To understand the use and creation of open licenses and open educational resources, including their proper attribution.

Activities

- To share resources using links or as attachments, e.g. to e-mails.
- To share resources on online platforms or personal or organisational websites/blogs.
- To share one's own repositories of resources with others, managing their access and rights as appropriate.
- To respect possible copyright restrictions to using, re-using and modifying digital resources.
- To appropriately reference sources when sharing or publishing resources subject to copyright.
- To attribute (open) licenses to self-created resources.
- To take measures to protect sensitive data and resources (e.g. students' grades, exams).
- To share administrative and student-related data with colleagues, students and parents, as appropriate.

Progression		Proficiency statements
Newcomer (A1) 	**Not employing** strategies for sharing resources.	I store and organise digital resources for my own future use.
Explorer (A2) 	**Managing** resources using **basic strategies.**	I share educational content via e-mail attachments or through links. I am aware that some resources distributed on the Internet are copyrighted.
Integrator (B1) 	**Effectively sharing** and protecting resources **using basic strategies.**	I share educational content on virtual learning environments or by uploading, linking or embedding it e.g. on a course website or blog. I effectively protect sensitive content, e.g. exams, students' reports. I understand the copyright rules that apply to the digital resources I use for school purposes (images, text, audio and film).
Expert (B2) 	**Professionally sharing** resources.	I share resources embedding them into digital environments. I effectively protect personal and sensitive data and restrict access to resources as appropriate. I correctly reference resources affected by copyright.
Leader (C1) 	Digitally **publishing** self-created resources.	I compile comprehensive digital content repositories and make them available to learners or other educators. I apply licenses to the resources I publish online.
Pioneer (C2) 	**Professionally publishing** self-created digital content.	I annotate the resources I digitally share and enable others to comment, rate, modify, re-arrange or add to them.

03

Teaching and Learning

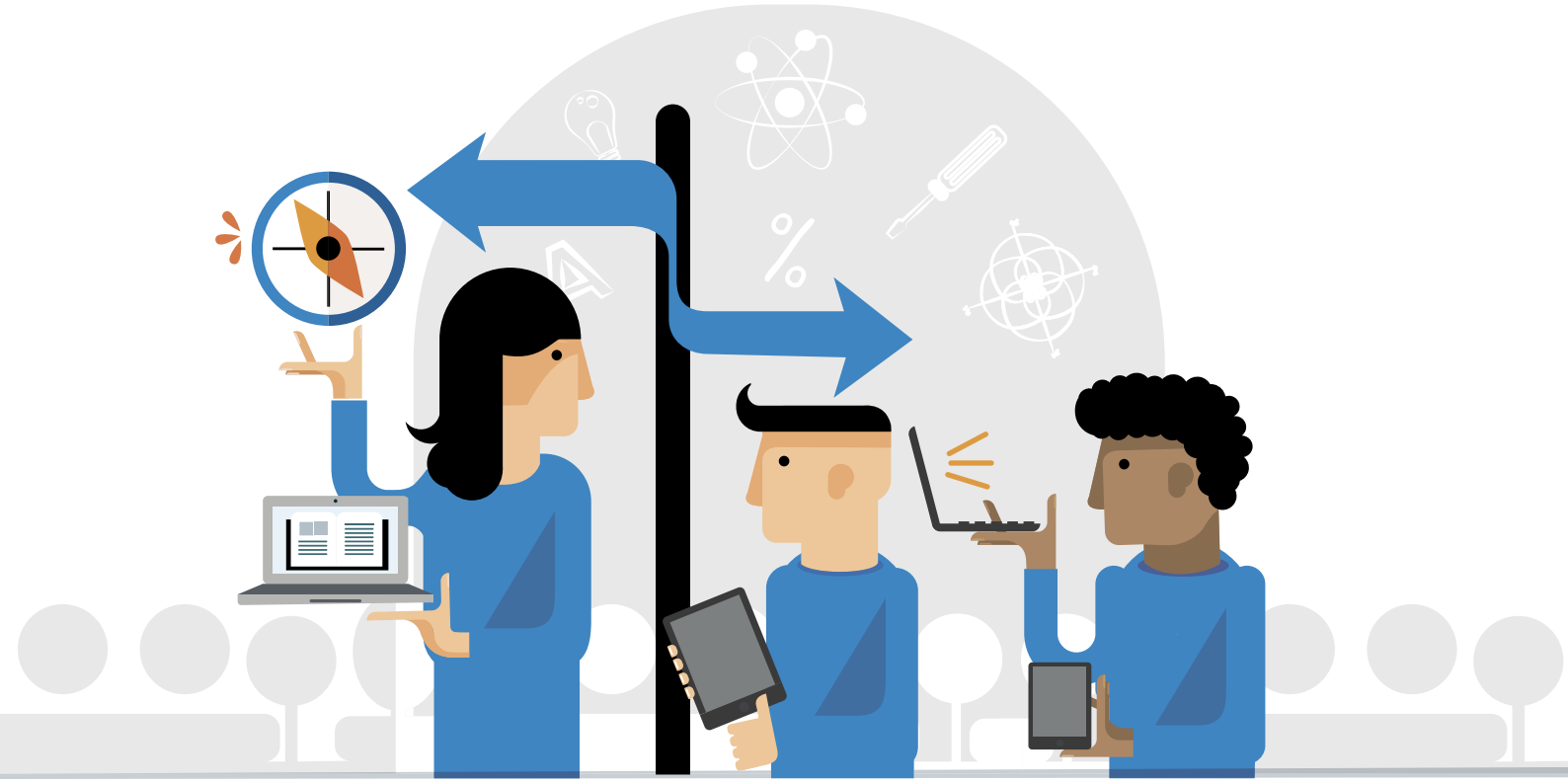
Teaching

To plan for and implement digital devices and resources in the teaching process, so as to enhance the effectiveness of teaching interventions. To appropriately manage and orchestrate digital teaching interventions. To experiment with and develop new formats and pedagogical methods for instruction.

Activities

- To use classroom technologies to support instruction, e.g. electronic whiteboards, mobile devices.
- To structure the lesson so that different (teacher-led and learner-led) digital activities jointly re-inforce the learning objective.
- To set up learning sessions, activities and interactions in a digital environment.
- To structure and manage content, collaboration and interaction in a digital environment.
- To consider how educator-led digital interventions – whether face-to-face or in a digital environment - can best support the learning objective.
- To reflect on the effectiveness and appropriateness of the digital pedagogical strategies chosen and flexibly adjust methods and strategies.
- To experiment with and develop new formats and pedagogical methods for instruction (e.g. flipped classroom).

Progression		Proficiency statements
Newcomer (A1) 	Making **little use** of digital technologies for instruction.	I do not or only very rarely use digital devices or digital content in my teaching.
Explorer (A2) 	Making **basic use** of available digital technologies for instruction.	I use available classroom technologies, e.g. digital whiteboards, projectors, PCs. I choose digital technologies according to the learning objective and context.
Integrator (B1) 	**Integrating** available digital technologies **meaningfully** into the teaching process.	I organise and manage the integration of digital devices (e.g. classroom technologies, students' devices) into the teaching and learning process. I manage the integration of digital content, e.g. videos, interactive activities, into the teaching and learning process.
Expert (B2) 	Using digital technologies purposefully **to enhance pedagogic strategies.**	I consider appropriate social settings and interaction modes when integrating digital technologies. I use digital technologies in teaching to increase methodological variation. I set up learning sessions or other interactions in a digital environment.
Leader (C1) 	**Orchestrating, monitoring** and flexibly **adapting** the use of digital technologies to enhance pedagogic strategies.	I structure learning sessions so that different (teacher-led and learner-led) digital activities jointly re-inforce the learning objective. I structure and manage content, contributions and interaction in a digital environment. I continuously evaluate the effectiveness of digitally enhanced teaching strategies and revise my strategies accordingly.
Pioneer (C2) 	Using digital technologies to **innovate teaching strategies.**	I provide full courses or learning modules in a digital learning environment. I experiment with and develop new formats and pedagogical methods for instruction.



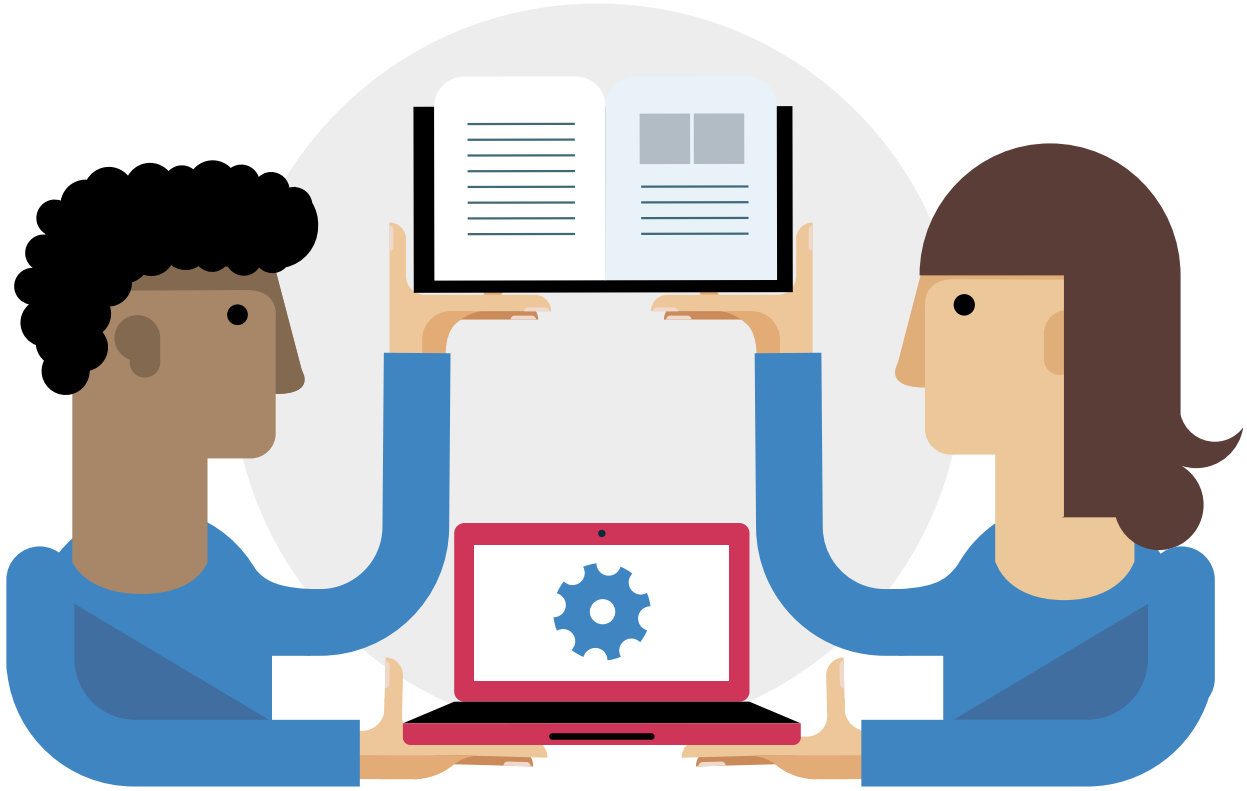
Guidance

To use digital technologies and services to enhance the interaction with learners, individually and collectively, within and outside the learning session. To use digital technologies to offer timely and targeted guidance and assistance. To experiment with and develop new forms and formats for offering guidance and support.

Activities

- To use digital communication tools to respond promptly to learners' questions and doubts, e.g. on homework assignments.
- To set up learning activities in digital environments, having foreseen learners' needs for guidance and catering for them.
- To interact with learners in collaborative digital environments.
- To digitally monitor student behaviour in class and offer guidance when needed.
- To use digital technologies to remotely monitor student progress and intervene when needed, while allowing for self-regulation.
- To experiment with and develop new forms and formats for offering guidance and support, using digital technologies.

Progression		Proficiency statements
Newcomer (A1) 	Making **little use** of digital technologies for interacting with learners.	I do not or only very rarely communicate with learners through digital means, e.g. e-mail.
Explorer (A2) 	Employing **basic** digital strategies to interact with learners.	I use digital technologies, e.g. e-mail or chat, to respond to learners' questions or doubts, e.g. on homework assignments.
Integrator (B1) 	Using digital technologies to enhance **interaction** with learners.	I use a common digital communication channel with my learners to respond to their questions and doubts. I am frequently in contact with learners and listen to their problems and questions.
Expert (B2) 	Using digital technologies to enhance **monitoring** and **guidance.**	I interact with learners in the collaborative digital environments I use, monitoring their behaviour and providing individual guidance and support as needed. I experiment with new forms and formats for offering guidance and support, using digital technologies.
Leader (C1) 	Employing digital technologies **strategically** and **purposefully** to provide guidance and support.	When I set up learning activities in digital environments, I foresee learners' needs for guidance and cater for them, e.g. with a help or FAQ section, or with video tutorials. When I implement digital learning activities in class, I make sure I am able to (digitally) monitor student behaviour, so that I can offer guidance when needed.
Pioneer (C2) 	Using digital technologies **to innovate guidance** provision.	I develop new forms and formats for offering guidance and support, using digital technologies.



Collaborative learning

To use digital technologies to foster and enhance learner collaboration. To enable learners to use digital technologies as part of collaborative assignments, as a means of enhancing communication, collaboration and collaborative knowledge creation.

Activities

- To implement collaborative learning activities in which digital devices, resources or digital information strategies are used.
- To implement collaborative learning activities in a digital environment, e.g. using blogs, wikis, learning management systems.
- To employ digital technologies for collaborative knowledge exchange among learners.
- To monitor and guide learners in their collaborative knowledge generation in digital environments.
- To require learners to digitally present their collaborative efforts and assist them in doing so.
- To use digital technologies for peer-assessment and as a support for collaborative self-regulation and peer-learning.
- To use digital technologies to experiment with new formats and methods for collaborative learning.

Progression		Proficiency statements
Newcomer (A1) 	Making **little use** of digital technologies in collaborative learning activities.	I do not or only very rarely consider how students could use digital technologies in collaborative activities or assignments.
Explorer (A2) 	**Encouraging** learners to use digital technologies in their collaborative activities.	When implementing collaborative activities or projects, I encourage learners to use digital technologies to support their work, e.g. for internet search or to present their results.
Integrator (B1) 	**Implementing** digital technologies into the design of collaborative activities.	I design and implement collaborative activities, in which digital technologies are used by learners for their collaborative knowledge generation, e.g. for sourcing and exchanging information. I require learners to document their collaborative efforts using digital technologies, e.g. digital presentations, videos, blog posts.
Expert (B2) 	Using **digital environments** to support collaborative learning.	I set up collaborative activities in a digital environment, e.g. blogs, wikis, moodle, virtual learning environments. I monitor and guide learners' collaborative interaction in digital environments. I use digital technologies to enable learners to share insights with others and receive peer-feedback, also on individual assignments.
Leader (C1) 	Using digital environments for learners' **collaborative knowledge generation** and **peer assessment.**	I design and manage diverse collaborative learning activities, where learners use a variety of technologies to collaboratively conduct research, document findings and reflect on their learning, both in physical and in virtual learning environments. I use digital technologies for peer-assessment and as a support for collaborative self-regulation and peer-learning.
Pioneer (C2) 	Using digital technologies **to innovate** learner collaboration.	I use digital technologies to invent new formats for collaborative learning.

Self-regulated learning

To use digital technologies to support self-regulated learning processes, i.e. to enable learners to plan, monitor and reflect on their own learning, provide evidence of progress, share insights and come up with creative solutions.

Activities

- To use digital technologies (e.g. blogs, diaries, planning tools) to allow learners to plan their own learning.
- To use digital technologies to allow learners to collect evidence and record progress, e.g. audio or video recordings, photos.
- To use digital technologies (e.g. ePortfolios, learners' blogs) to allow learners to record and showcase their work.
- To use digital technologies to enable learners to reflect on and self-assess their learning process.

Progression		Proficiency statements
Newcomer (A1) 	Making **little use** of digital technologies for self-regulated learning.	I do not or only very rarely consider how students could use digital technologies in self-regulated activities or assignments.
Explorer (A2) 	**Encouraging** learners to use digital technologies in self-regulated learning activities.	I encourage learners to use digital technologies to support their individual learning activities and assignments, e.g. for information retrieval or presenting results.
Integrator (B1) 	**Implementing** digital technologies into the design of self-regulated learning activities.	I encourage learners to use digital technologies to collect evidence and record progress, e.g. to produce audio or video recordings, photos, texts. I use digital technologies (e.g. ePortfolios, learners' blogs) to allow learners to record and showcase their work. I use digital technologies for learner self-assessment.
Expert (B2) 	Using digital environments to **comprehensively** support self-regulated learning.	I use digital technologies or environments (e.g. ePortfolios, blogs, diaries, planning tools) to allow learners to manage and document all stages of their learning, e.g. for planning, information retrieval, documentation, reflection and self-assessment. I help learners in developing, applying and revising suitable criteria for self-assessment, with the support of digital technologies.
Leader (C1) 	**Critically reflecting** on the digital strategies used to foster self-regulated learning.	I reflect on the appropriateness of my digital strategies in fostering self-regulated learning and continuously enhance my strategies.
Pioneer (C2) 	Developing **new** digital formats and/or pedagogic **approaches** for self-regulated learning.	I develop new digital formats and/or pedagogical approaches to foster self-directed learning.

04

Assessment

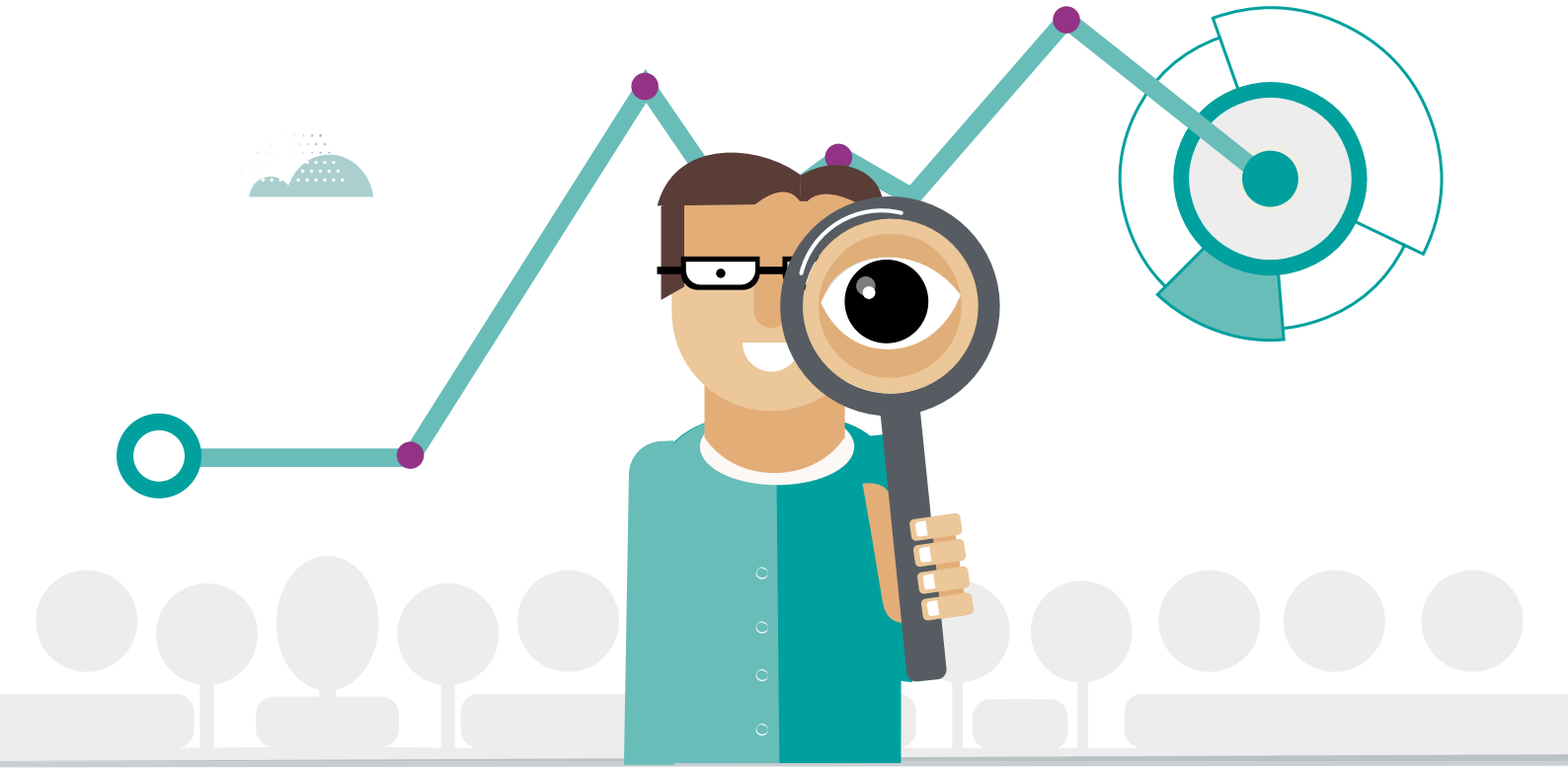
Assessment strategies

To use digital technologies for formative and summative assessment. To enhance the diversity and suitability of assessment formats and approaches.

Activities

- To use digital assessment tools to monitor the learning process and obtain information on learners' progress.
- To use digital technologies to enhance formative assessment strategies, e.g. using classroom response systems, quizzes, games.
- To use digital technologies to enhance summative assessment in tests, e.g. through computer-based tests, implementing audio or video (e.g. in language learning), using simulations or subject-specific digital technologies as test environments.
- To use digital technologies to scaffold learners' assignments and their assessment, e.g. through ePortfolios.
- To use of a variety of digital and non-digital assessment formats and be aware of their benefits and drawbacks.
- To critically reflect on the appropriateness digital assessment approaches and adapt strategies accordingly.

Progression		Proficiency statements
Newcomer (A1) 	Making **little use** of digital technologies for assessment.	I do not or only very rarely use digital assessment formats.
Explorer (A2) 	Integrating **digital technologies** into **traditional assessment** strategies.	I use digital technologies to create assessment tasks which are then administered in paper-format. I plan for students' use of digital technologies in assessment tasks, e.g. in support of assignments.
Integrator (B1) 	**Employing** and **modifying** existing digital assessment tools and formats.	I use some existing digital technologies for formative or summative assessment, e.g. digital quizzes, e-portfolios, games. I adapt digital assessment tools to support my specific assessment goal, e.g. create a test using a digital test system.
Expert (B2) 	**Strategically** using a **range** of digital assessment formats.	I use a range of e-assessment software, tools and approaches, for formative assessment, both in the classroom and for learners to use after school. I select between different assessment formats the one that most adequately captures the nature of the learning outcome to be assessed. I design digital assessments which are valid and reliable.
Leader (C1) 	**Comprehensively** and **critically** selecting, creating and adapting digital assessment formats.	I use a variety of digital and non-digital assessment formats, aligned with content and technology standards, and am aware of their benefits and drawbacks. I critically reflect on my use of digital technologies for assessment and adapt my strategies accordingly.
Pioneer (C2) 	Developing **innovative** assessment formats, using digital technologies.	I develop new digital formats for assessment, which reflect innovative pedagogic approaches and allow for the assessment of transversal skills.



Analysing evidence

To generate, select, critically analyse and interpret digital evidence on learner activity, performance and progress, in order to inform teaching and learning.

Activities

- To design and implement learning activities which generate data on learner activity and performance.
- To use digital technologies to record, compare and synthesize data on learner progress.
- To be aware that learner activity in digital environments generates data that can be used to inform teaching and learning.
- To analyse and interpret available evidence on learner activity and progress, including the data generated by the digital technologies used.
- To consider, combine and evaluate different sources of evidence on learner progress and performance.
- To critically value the evidence available to inform teaching and learning.

Progression		Proficiency statements
Newcomer (A1) 	Making **little use** of digital data for monitoring progress.	I do not or only very rarely refer to digitally recorded data to understand where my students stand.
Explorer (A2) 	Evaluating **basic data** on learner activity and performance.	I evaluate administrative data (e.g. attendance) and data on student performance (e.g. grades) for individual feedback and targeted interventions. I am aware that digital assessment tools (e.g. quizzes, voting systems) can be used within the teaching process to provide me with timely feedback on learners' progress.
Integrator (B1) 	Evaluating a **range of** digital **data** to inform teaching.	I evaluate the data resulting from digital assessments to inform learning and teaching. I am aware that the data on my learners' activity, as it is recorded in the digital environments which I use with them, can help me monitor their progress and provide them with timely feedback and assistance.
Expert (B2) 	**Strategically** employing digital tool for **data generation.**	I use digital technologies (e.g. quizzes, voting systems, games) within the teaching process to provide me with timely feedback on learners' progress. I use the data analysis tools provided by the digital environments I use to monitor and visualise activity. I interpret the data and evidence available in order to better understand individual learners' needs for support.
Leader (C1) 	Using digital data to **reflect on** learning **patterns** and teaching strategies.	I continuously monitor digital activity and regularly reflect on digitally recorded learner data to timely identify and react upon critical behaviour and individual problems. I evaluate and synthesize the data generated by the various digital technologies I use to reflect on the effectiveness and suitability of different teaching strategies and learning activities, in general and for certain learner groups.
Pioneer (C2) 	**Innovating** data generation and evaluation.	I implement advanced data generation and visualisation methods into the digital activities I employ, e.g. based on learning analytics. I critically assess and discuss the value and validity of different data sources as well as the appropriateness of established methods for data analysis.

Feedback and Planning

To use digital technologies to provide targeted and timely feedback to learners. To adapt teaching strategies and to provide targeted support, based on the evidence generated by the digital technologies used. To enable learners and parents to understand the evidence provided by digital technologies and use it for decision-making.

Activities

- To use digital technology to grade and give feedback on electronically submitted assignments.
- To use assessment management systems to enhance the effectiveness of feedback provision.
- To use digital technologies to monitor learner progress and provide support when needed.
- To adapt teaching and assessment practices, based on the data generated by the digital technologies used.
- To provide personal feedback and offer differentiated support to learners, based on the data generated by the digital technologies used.
- To enable learners to evaluate and interpret the results of formative, summative, self- and peer-assessments.
- To assist learners in identifying areas for improvement and jointly develop learning plans to address these areas.
- To use digital technologies to enable learners and/or parents to remain updated on progress and make informed choices on future learning priorities, optional subject or future studies.

Progression		Proficiency statements
Newcomer (A1) 	Making **little use** of digital data for feedback and planning.	I am not aware how digital technologies can help me in providing feedback to learners or adapting my teaching strategies.
Explorer (A2) 	Using digital technologies to **inform feedback.**	I use digital technologies to compile an overview on learners' progress, which I use as a basis for offering feedback and advice.
Integrator (B1) 	Using digital technologies to **provide feedback.**	I use digital technology to grade and give feedback on electronically submitted assignments. I help students and/or parents to access information on learners' performance, using digital technologies.
Expert (B2) 	Using digital data to enhance the **effectiveness** of feedback and support.	I adapt my teaching and assessment practices, based on the data generated by the digital technologies I use. I provide personal feedback and offer differentiated support to learners, based on the data generated by the digital technologies used. I use digital technologies to enable learners and parents to remain updated on progress and make informed choices on future learning priorities, optional subjects or future studies.
Leader (C1) 	Using digital technologies to **personalise** feedback and support.	I assist learners in identifying areas for improvement and jointly develop learning plans to address these areas, based on the evidence available. I use the data generated by digital technologies to reflect on which teaching strategies work well for which kind of learners and adapt my teaching strategies accordingly.
Pioneer (C2) 	Using digital data to **evaluate** and **improve teaching**	I reflect on, discuss, re-design and innovate teaching strategies in response to the digital evidence I find, as concerns learners' preferences and needs as well as the effectiveness of different teaching interventions and learning formats.

05

Empowering Learners

Accessibility and inclusion

To ensure accessibility to learning resources and activities, for all learners, including those with special needs. To consider and respond to learners' (digital) expectations, abilities, uses and misconceptions, as well as contextual, physical or cognitive constraints to their use of digital technologies.

Activities

- To provide equitable access to appropriate digital technologies and resources, e.g. ensuring that all students have access to the digital technologies used.
- To select and employ digital pedagogical strategies which respond to learners' digital context, e.g. contextual constraints to their technology use (e.g. availability), competences, expectations, attitudes, misconceptions and misuses.
- To employ digital technologies and strategies, e.g. assistive technologies, designed for learners' in need of special support (e.g. learners with physical or mental constraints; learners with learning disorders).
- To consider and respond to potential accessibility issues when selecting, modifying or creating digital resources and to provide alternative or compensatory tools or approaches for learners with special needs.
- To employ design principles for increasing accessibility for the resources and digital environments used in teaching.
- To continuously monitor and reflect on the suitability of the measures implemented to improve accessibility and adapt strategies accordingly.

Progression		Proficiency statements
Newcomer (A1) 	Being **concerned** about accessibility and inclusion.	I am afraid that the use of digital technologies in teaching will make it even more difficult for already disadvantaged students to participate and keep up with the others.
Explorer (A2) 	Being **aware** of accessibility and inclusion issues.	I understand the importance of ensuring equal access to the digital technologies used for all students. I am aware that digital technologies can hinder or improve accessibility.
Integrator (B1) 	**Addressing** accessibility and inclusion.	I understand how access to digital technology creates divides and how students' social and economic conditions have an impact on the way technology is used. I ensure that all students have access to the digital technologies I use. I am aware that compensatory digital technologies can be used for learners' in need of special support (e.g. learners with physical or mental constraints; learners with learning disorders).
Expert (B2) 	**Enabling** accessibility and inclusion.	I select digital pedagogical strategies that adapt to learners' digital contexts, e.g. limited usage time, type of device available. I consider and respond to potential accessibility issues when selecting, modifying or creating digital resources and provide alternative or compensatory tools or approaches for learners with special needs. I employ digital technologies and strategies, e.g. assistive technologies, to remediate individual leaners' accessibility problems, e.g. visual or hearing impairments.
Leader (C1) 	**Enhancing** accessibility and inclusion.	I select and employ digital pedagogical strategies fitted to learners' digital technology uses, competences, expectations, attitudes, misconceptions and misuses. I employ design principles for increasing accessibility for the resources and digital environments used in teaching, e.g. as concerns font, size, colours, language, layout, structure. I continuously monitor and reflect on the suitability of the measures implemented to improve accessibility and adapt my strategies accordingly.
Pioneer (C2) 	**Innovating** strategies for accessibility and inclusion.	I reflect on, discuss, re-design and innovate strategies for equal access to and inclusion in digital education.

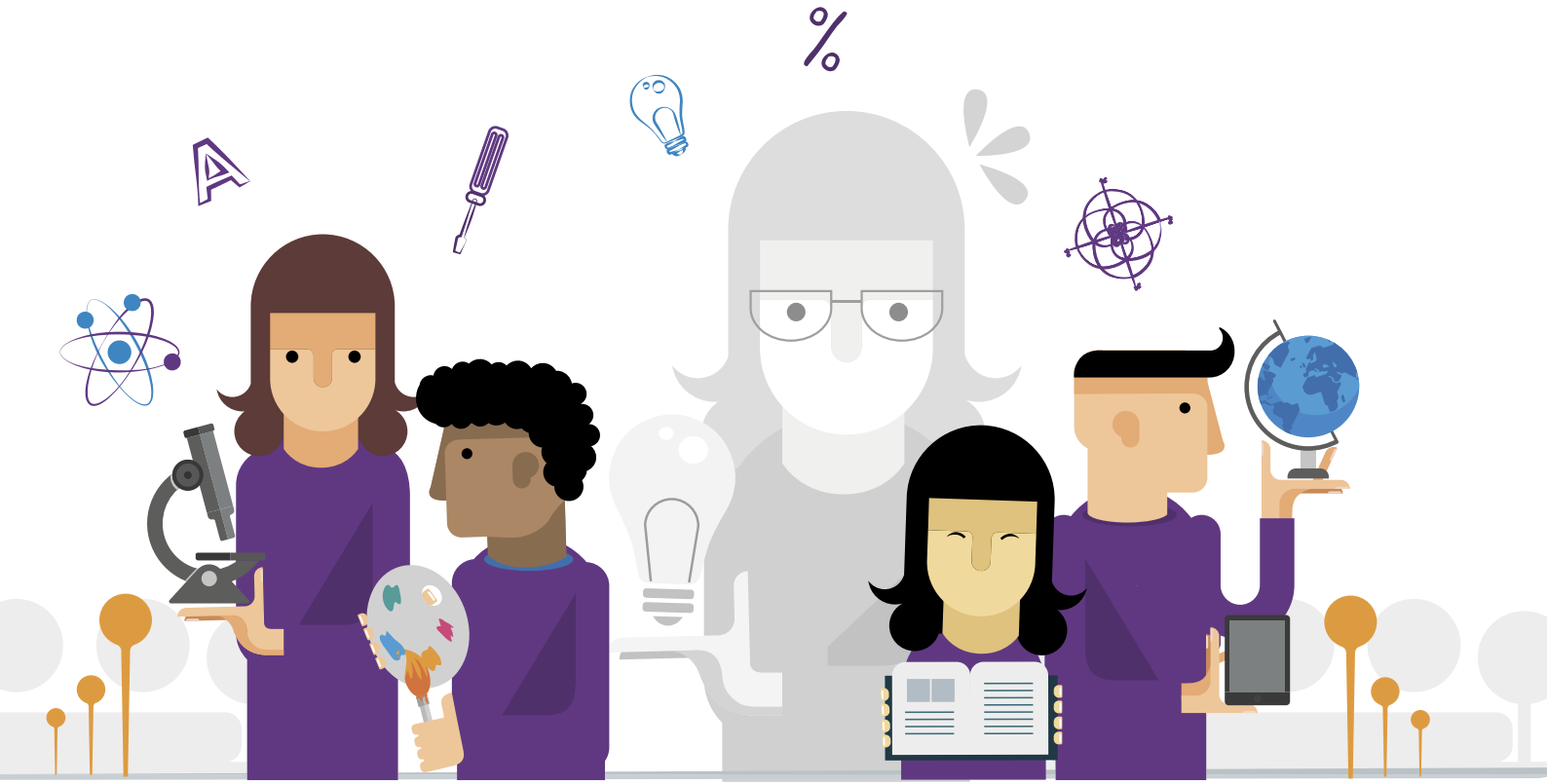
Differentiation and personalisation

To use digital technologies to address learners' diverse learning needs, by allowing learners to advance at different levels and speeds, and to follow individual learning pathways and objectives.

Activities

- To use digital technologies to address the special needs of individual learners (e.g. dyslexia, ADHD, overachievers).
- To allow for different learning pathways, levels and speeds when designing, selecting and implementing digital learning activities.
- To devise individual learning plans and use digital technologies to support these.

Progression		Proficiency statements
Newcomer (A1) 	Being **uncertain** about the potential of digital technologies for differentiation and personalisation.	I do not know how digital technologies can help me offer personalised learning opportunities.
Explorer (A2) 	Being **aware** of the potential of digital technologies for differentiation and personalisation.	I am aware that digital technologies can support differentiation and personalisation, e.g. by providing activities at different levels and speeds.
Integrator (B1) 	**Employing** digital technologies for differentiation and personalisation.	I select and use some learning activities, e.g. quizzes or games, that allow learners to proceed at different speeds, select different levels of difficulty and/or repeat activities previously not solved adequately.
Expert (B2) 	**Strategically** using a **range** of digital technologies for differentiation and personalisation.	When designing learning and assessment activities, I use a range of different digital technologies, which I adapt and adjust to account for different needs, levels, speeds and preferences. When sequencing and implementing learning activities, I allow for different learning pathways, levels and speeds and flexibly adapt my strategies to changing circumstances or needs.
Leader (C1) 	**Comprehensively** and **critically** implementing differentiated and personalised learning.	I design, in collaboration with learners and/or parents, personalised learning plans which allow all learners to follow their individual learning needs and preferences, with the aid of appropriate digital resources. I reflect on how effectively the teaching strategies employed foster differentiation and personalisation and adapt my teaching strategies and digital activities accordingly.
Pioneer (C2) 	**Innovating** strategies for differentiation and personalisation, using digital technologies.	I reflect on, discuss, re-design and innovate pedagogic strategies for personalising education through the use of digital technologies.



Actively engaging learners

To use digital technologies to foster learners' active and creative engagement with a subject matter. To use digital technologies within pedagogic strategies that foster learners' transversal skills, deep thinking and creative expression. To open up learning to new, real-world contexts, which involve learners themselves in hands-on activities, scientific investigation or complex problem solving, or in other ways increase learners' active involvement in complex subject matters.

Activities

- To use digital technologies to visualise and explain new concepts in a motivating and engaging way, e.g. by employing animations or videos.
- To employ digital learning environments or activities which are motivating and engaging, e.g. games, quizzes.
- To put learners' active uses of digital technologies at the centre of the instructional process.
- To use digital technologies to allow learners to actively engage with the subject matter at hand, e.g. using different senses, manipulating virtual objects, varying the problem set up to enquire into its structure, etc.
- To select appropriate digital technologies for fostering active learning in a given learning context or for a specific learning objective.
- To reflect on how suitable the different digital technologies used are in increasing learners' active learning, and to adapt strategies and choices accordingly.

Progression		Proficiency statements
Newcomer (A1) 	Making **little use** of digital technologies for learner engagement.	I only very rarely, if at all, use digital technologies to motivate or engage learners.
Explorer (A2) 	Using digital technologies **to engage** learners.	I use digital technologies to visualise and explain new concepts in a motivating and engaging way, e.g. by employing animations or videos. I employ digital learning activities which are motivating and engaging, e.g. games, quizzes.
Integrator (B1) 	Fostering learners' **active use of digital technologies.**	I put learners' active use of digital technologies at the centre of the instructional process. I choose the most appropriate tool for fostering learner active engagement in a given learning context or for a specific learning objective.
Expert (B2) 	Using digital technologies for learners' **active engagement with the subject matter.**	I use a range of digital technologies to create a relevant, rich and effective digital learning environment, e.g. by addressing different sensory channels, learning styles and strategies, by methodologically varying activity types and group compositions. I reflect on how effective the teaching strategies employed are in increasing learner engagement and active learning.
Leader (C1) 	**Comprehensively** and **critically** implementing strategies for active learning.	I select, design, employ and orchestrate the use of digital technologies within the learning process according to their potential for fostering learners' active, creative and critical engagement with the subject matter. I reflect on how suitable the different digital technologies I use are in increasing learners' active learning and adapt my strategies and choices accordingly.
Pioneer (C2) 	**Innovating** digital strategies for active learning.	I reflect on, discuss, re-design and innovate pedagogic strategies for actively engaging learners.

06

Facilitating Learners' Digital Competence

Information and media literacy

To incorporate learning activities, assignments and assessments which require learners to articulate information needs; to find information and resources in digital environments; to organise, process, analyse and interpret information; and to compare and critically evaluate the credibility and reliability of information and its sources.

Activities

To incorporate learning activities, assignments and assessments which encourage and require learners:

- **To articulate information needs, to search for data, information and content in digital environments, to access them and to navigate between them.**
- **To create and update personal search strategies.**
- **To adapt search strategies based on the quality of information found.**
- **To analyse, compare and critically evaluate the credibility and reliability of sources of data, information and digital content.**
- **To organise, store and retrieve data, information and content in digital environments.**
- **To organise and process information in a structured environment.**

Progression		Proficiency statements
Newcomer (A1) 	Making **little use** of strategies fostering learners' information literacy.	I do not or only very rarely consider how I could foster learners' information and media literacy.
Explorer (A2) 	**Encouraging** learners to use digital technologies for informational retrieval.	I encourage learners to use digital technologies for information retrieval, e.g. on assignments.
Integrator (B1) 	**Implementing** activities fostering learners' information and media literacy.	I implement learning activities in which learners use digital technologies for information retrieval. I teach learners how to find information, how to assess its reliability, how to compare and combine information from different sources.
Expert (B2) 	**Strategically** using a **range** of pedagogic strategies to foster learners' information and media literacy.	I use a range of different pedagogic strategies to enable learners to critically compare and meaningfully combine information from different sources. I teach learners how to quote sources appropriately.
Leader (C1) 	**Comprehensively** and **critically** fostering learners' information and media literacy.	I critically reflect on how suitable my pedagogic strategies are in fostering learners' information and media literacy and adapt my strategies accordingly.
Pioneer (C2) 	Using **innovative formats** for fostering learners' information and media literacy.	I reflect on, discuss, re-design and innovate pedagogic strategies for fostering learners' information and media literacy.

Digital communication & collaboration

To incorporate learning activities, assignments and assessments which require learners to effectively and responsibly use digital technologies for communication, collaboration and civic participation.

Activities

To incorporate learning activities, assignments and assessments which encourage and require learners:

- To interact through a variety of digital technologies.
- To understand appropriate digital communication means for a given context.
- To share data, information and digital content with others through appropriate digital technologies.
- To know about referencing and attribution practices.
- To participate in society through the use of public and private digital services.
- To seek opportunities for self-empowerment and for participatory citizenship through appropriate digital technologies.
- To use digital technologies for collaborative processes, and for co-construction and co-creation of resources and knowledge.
- To be aware of behavioural norms and know-how while using digital technologies and interacting in digital environments.
- To adapt communication strategies to the specific audience and to be aware of cultural and generational diversity in digital environments
- To create and manage one or multiple digital identities.
- To protect one's own reputation.
- To deal with the data that one produces through several digital technologies, environments and services.

Progression		Proficiency statements
Newcomer (A1) 	Making **little use** of strategies fostering learners' digital communication and collaboration.	I do not or only very rarely consider how I could foster learners' digital communication and collaboration.
Explorer (A2) 	**Encouraging** learners to use digital technologies for communication and collaboration.	I encourage learners to use digital technologies to interact with other learners, with their educators, management staff and third parties.
Integrator (B1) 	**Implementing** activities fostering learners' digital communication and collaboration.	I implement learning activities in which learners use digital technologies for communication. I guide learners in respecting behavioural norms, appropriately selecting communication strategies and channels, and being aware of cultural and social diversity in digital environments.
Expert (B2) 	**Strategically** using a **range** of pedagogic strategies to foster learners' digital communication and collaboration.	I use a range of different pedagogic strategies in which learners use digital technologies for communication and collaboration. I support and encourage learners to use digital technologies to participate in public discourses and to use digital technologies actively and consciously for civic participation.
Leader (C1) 	**Comprehensively** and **critically** fostering learners' digital communication and collaboration.	I incorporate assignments and learning activities which require learners to effectively and responsibly use digital technologies for communication, collaboration, knowledge co-creation, and civic participation. I critically reflect on how suitable my pedagogic strategies are in fostering learners' digital communication and collaboration and adapt my strategies accordingly.
Pioneer (C2) 	Using **innovative formats** for fostering learners' digital communication and collaboration.	I reflect on, discuss, re-design and innovate pedagogic strategies for fostering learners' digital communication and collaboration.

Digital content creation

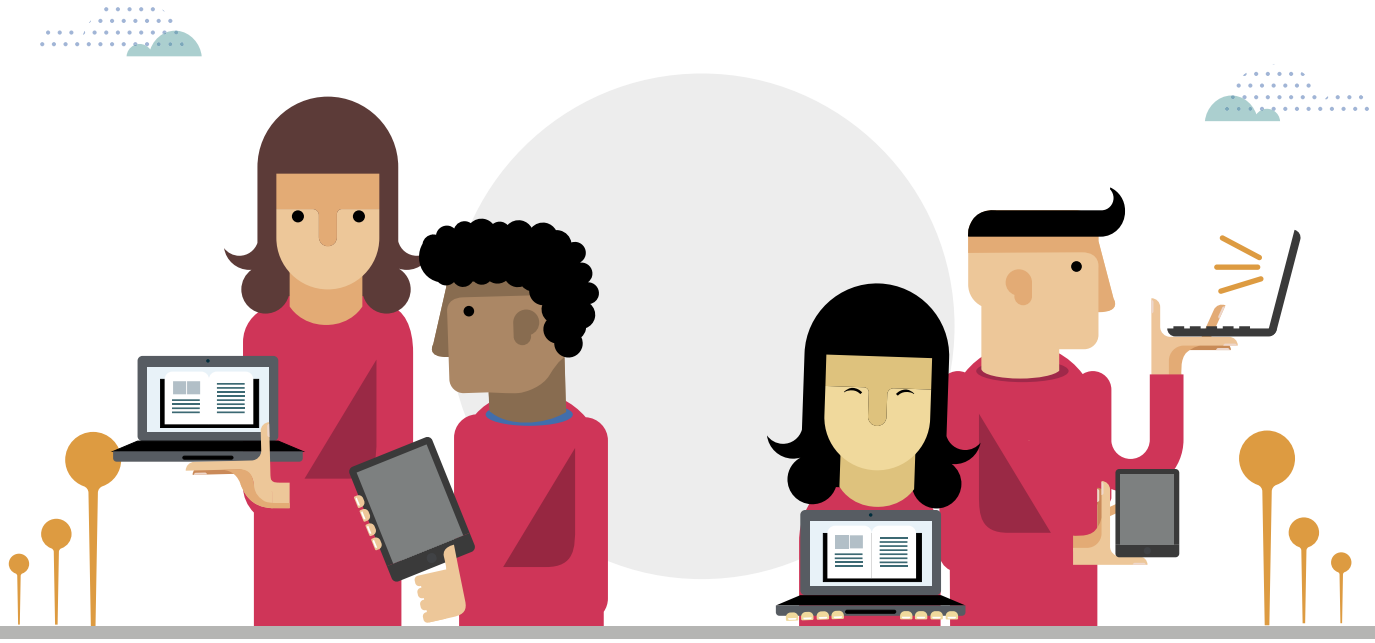
To incorporate learning activities, assignments and assessments which require learners to express themselves through digital means, and to modify and create digital content in different formats. To teach learners how copyright and licenses apply to digital content, how to reference sources and attribute licenses.

Activities

To incorporate learning activities, assignments and assessments which encourage and require learners:

- To create and edit digital content in different formats.
- To express themselves through digital means.
- To modify, refine, improve and integrate information and content into an existing body of knowledge.
- To create new, original and relevant content and knowledge.
- To understand how copyright and licenses apply to data, information and digital content.
- To plan and develop a sequence of understandable instructions for a computing system to solve a given problem or perform a specific task.

Progression		Proficiency statements
Newcomer (A1) 	Making **little use** of strategies fostering digital content creation by learners.	I do not or only very rarely consider how to foster digital content creation by learners.
Explorer (A2) 	**Encouraging** learners to use digital technologies for creating content.	I encourage learners to express themselves using digital technologies, e.g. by producing texts, images, videos.
Integrator (B1) 	**Implementing** activities fostering digital content creation by learners.	I implement learning activities in which learners use digital technologies to produce digital content, e.g. in the form of text, photos, other images, videos, etc. I encourage learners to publish and share their digital productions.
Expert (B2) 	**Strategically** using a **range** of pedagogic strategies to foster digital content creation by learners.	I use a range of different pedagogic strategies to enable learners to express themselves digitally, e.g. by contributing to wikis or blogs, by using ePortfolios for their digital creations. I enable learners to understand the concept of copyright and licenses and how to re-use digital content appropriately.
Leader (C1) 	**Comprehensively** and **critically** fostering digital content creation by learners.	I detect and counteract plagiarism, e.g. by using digital technologies. I critically reflect on the suitability of my pedagogic strategies in fostering learners' creative digital expression and adapt my strategies accordingly.
Pioneer (C2) 	Using **innovative formats** for fostering digital content creation by learners.	I guide learners in designing, publishing and licensing complex digital products, e.g. creating websites, blogs, games or apps. I reflect on, discuss, re-design and innovate pedagogic strategies for fostering digital expression and creation by learners.



Responsible use

To take measures to ensure learners' physical, psychological and social wellbeing while using digital technologies. To empower learners to manage risks and use digital technologies safely and responsibly.

Activities

To relay to learners a positive attitude towards digital technologies, encouraging their creative and critical use.

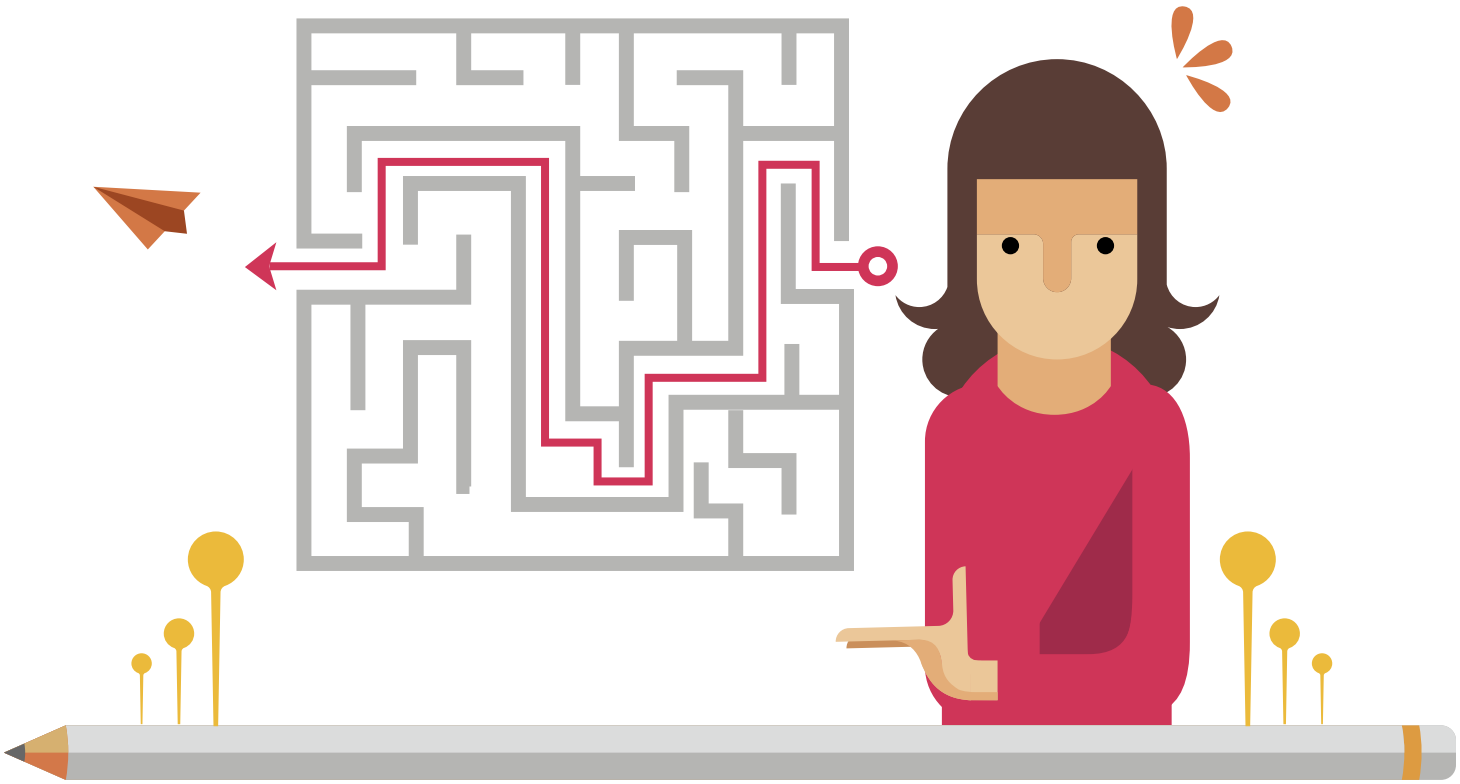
To enable learners:

- To protect devices and digital content, and to understand risks and threats in digital environments.
- To understand safety and security measures.
- To protect personal data and privacy in digital environments.
- To understand how to use and share personal information while being able to protect oneself and others from damages.
- To understand that digital services use a "Privacy policy" on how personal data is used.
- To avoid health risks and threats to physical and psychological well-being while using digital technologies.
- To protect oneself and others from possible dangers in digital environments (e.g. cyberbullying).
- To be aware of digital technologies for social wellbeing and social inclusion.
- To be aware of the environmental impact of digital technologies and their use.

To monitor student behaviour in digital environments in order to safeguard their wellbeing.

To react immediately and effectively when learners' wellbeing is threatened in digital environments (e.g. cyberbullying).

Progression		Proficiency statements
Newcomer (A1) 	Making **little use** of strategies fostering learners' digital wellbeing.	I am aware that digital technologies can positively and negatively affect learners' wellbeing.
Explorer (A2) 	**Encouraging** learners to use digital technologies safely and responsibly.	I foster learners' awareness of how digital technologies can positively and negatively affect health and wellbeing, e.g. by encouraging them to identify behaviour (of their own or of others) that makes them happy or sad. I foster learners' awareness of the benefits and drawbacks of the openness of the internet.
Integrator (B1) 	**Implementing measures** to ensure learners' wellbeing.	I give practical and experience-based advice on how to protect privacy and data, e.g. using passwords, adjusting the settings of social media. I assist learners in protecting their digital identity and managing their digital footprint. I advise learners on effective measures to confine or counter the impact of inappropriate behaviour (of their own or their peers).
Expert (B2) 	**Pedagogically supporting** learners' use of digital technologies to ensure their wellbeing.	I develop strategies to prevent, identify and respond to digital behaviour that negatively affects learners' health and wellbeing (e.g. cyberbullying). I encourage learners to assume a positive attitude towards digital technologies, being aware of possible risks and limits, but also being confident that they can manage these in order to reap the benefits.
Leader (C1) 	Strategically and critically developing **learners' responsible** and **safe use** of digital technologies.	I enable learners to understand risks and threats in digital environments (e.g. identity theft, fraud, stalking, phishing) and how to react appropriately. I critically reflect on the suitability of my pedagogic strategies to foster learners' digital wellbeing and adapt my strategies accordingly.
Pioneer (C2) 	Developing **innovative approaches** to fostering learners' ability to use digital technologies for their own wellbeing.	I reflect on, discuss, re-design and innovate pedagogic strategies to foster learners' ability to use digital technologies for their own wellbeing.



Digital problem solving

To incorporate learning activities, assignments and assessments which require learners to identify and solve technical problems, or to transfer technological knowledge creatively to new situations.

Activities

To incorporate learning activities, assignments and assessments which encourage and require learners:

- To identify technical problems when operating devices and using digital environments, and to solve them.
- To adjust and customise digital environments to personal needs.
- To identify, evaluate, select and use digital technologies and possible technological responses to solve a given task or problem.
- To use digital technologies in innovative ways to create knowledge.
- To understand where their digital competence needs to be improved or updated.
- To support others in their digital competence development.
- To seek opportunities for self-development and to keep up-to-date with the digital evolution.

Progression		Proficiency statements
Newcomer (A1) 	Making **little use** of strategies fostering learners' digital problem solving.	I do not or only very rarely consider how to foster learners' digital problem solving.
Explorer (A2) 	**Encouraging** learners to use digital technologies to solve problems.	I encourage learners to solve technical problems using trial and error. I encourage learners to transfer their digital competence to new situations.
Integrator (B1) 	**Implementing** activities fostering learners' digital problem solving.	I implement learning activities in which learners use digital technologies creatively, expanding their technical repertoire. I encourage learners to help each other in developing their digital competence.
Expert (B2) 	**Strategically** using a **range** of pedagogic strategies to foster learners' digital problem solving.	I use a range of different pedagogic strategies to enable learners to apply their digital competence to new situations or in new contexts. I encourage learners to reflect on the limits of their digital competence and help them identify suitable strategies for further developing it.
Leader (C1) 	**Comprehensively** and **critically** fostering learners' digital problem solving.	I enable learners to seek out different technological solutions to a problem, investigate their benefits and drawbacks and critically and creatively come up with a new solution or product. I critically reflect on the suitability of my pedagogic strategies to foster learners' digital competence and expand their repertoire of digital strategies, and adapt my methods accordingly.
Pioneer (C2) 	Using **innovative formats** for fostering learners' digital problem solving.	I enable learners to apply their digital competence in unconventional ways to new situations and creatively come up with new solutions or products. I reflect on, discuss, re-design and innovate pedagogic strategies for fostering learners' digital problem solving skills.

Glossary

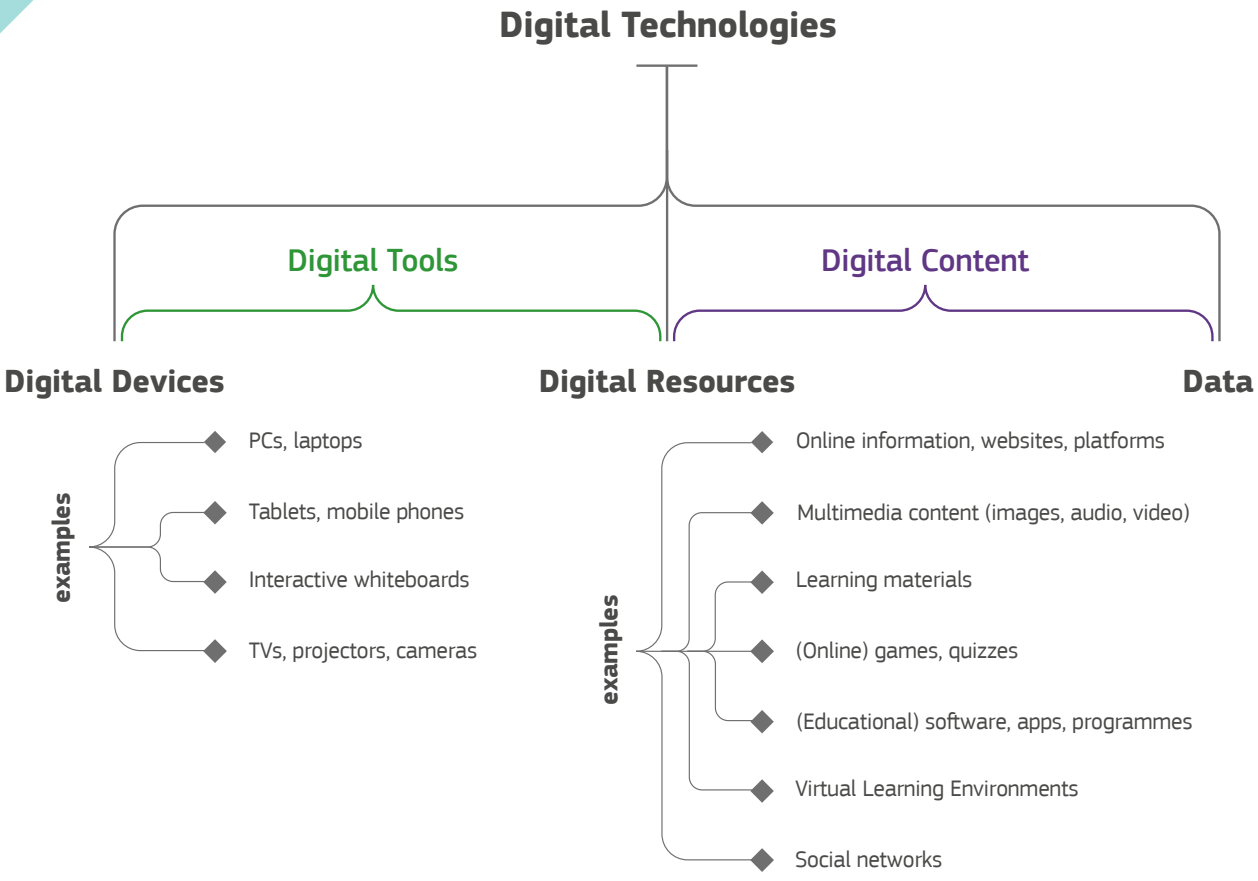
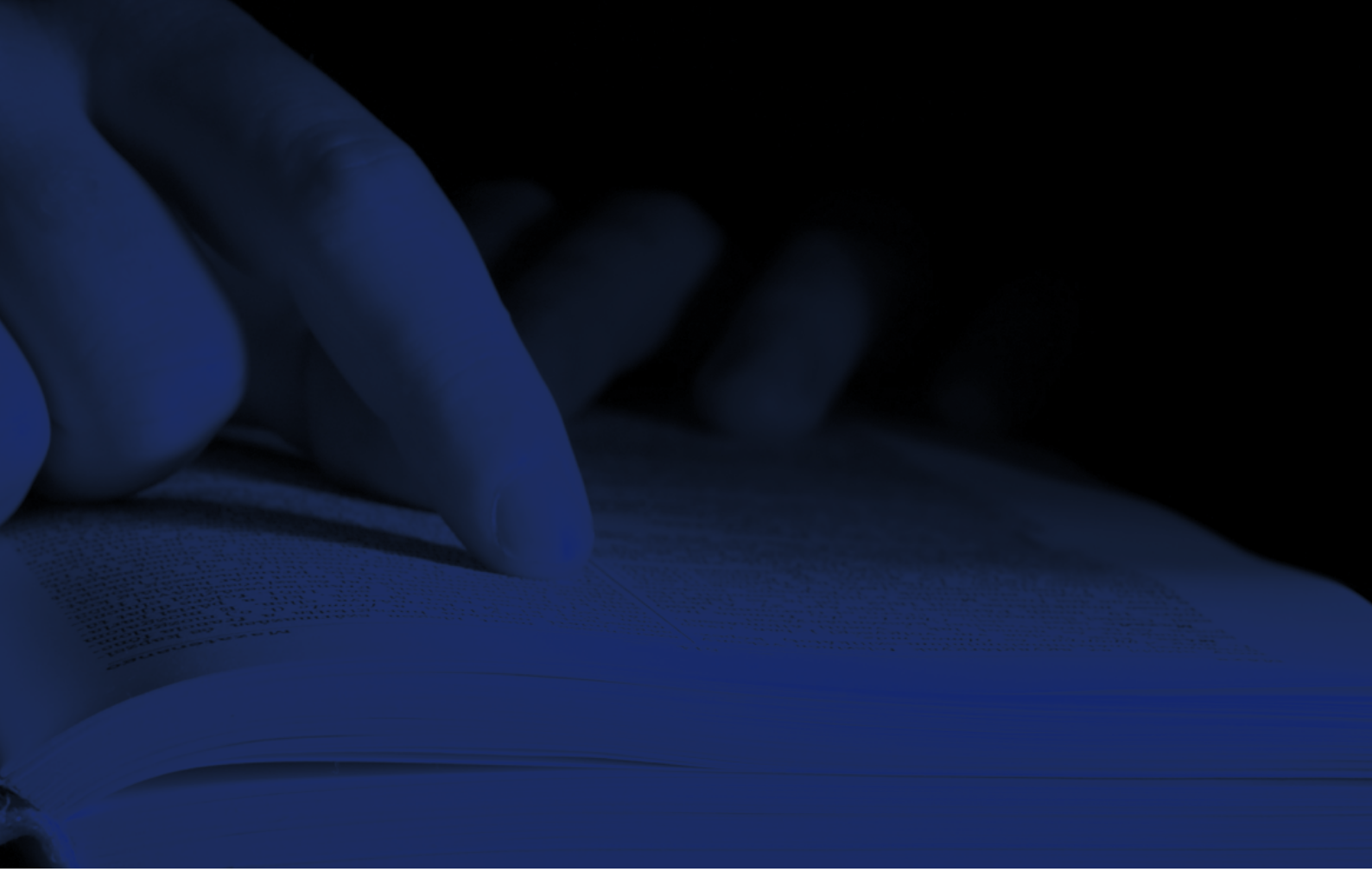


FIGURE 6: OVERVIEW OF KEY CONCEPTS USED IN DIGCOMPEDU



ACCEPTABLE USAGE POLICY (AUP)

An Acceptable Usage Policy (AUP) is a document that outlines a set of rules to be followed by users or customers of a set of computing resources, which could be a computer network, website or large computer system. An AUP clearly states what the user is and is not allowed to do with these resources.

Source: https://www.techopedia.com/definition/2471/acceptable-use-policy-aup

ASSISTIVE TECHNOLOGY

Assistive technology (AT) is a generic term used to refer to a group of software or hardware devices by which people with disabilities can access computers. They can be specially developed and marketed devices or off-the-shelf products that have been modified. Assistive technology can include devices such as alternative keyboards and mice, voice recognition software, monitor magnification software, multiple switch joysticks, and text-to-speech communication aids.

Source: http://www.webopedia.com

CONTINUOUS PROFESSIONAL DEVELOPMENT (CPD)

CPD is the means by which members of professions maintain, improve and broaden their knowledge and skills and develop the personal qualities required in their professional lives, usually through a range of short and long training programmes, some of which offer accreditation. This job-related continuing education and training refers to all organised, systematic education and training activities in which people take part in order to obtain knowledge and/or learn new skills for a current or a future job.

Adapted from http://www.umultirank.org/#!/glossary?trackType=home&sightMode=undefined&section=undefined

Adapted from http://creativecommons.org/about

DATA

A sequence of one or more symbols given meaning by specific act(s) of interpretation. Data as a general concept refers to the fact that some existing information or knowledge is represented or coded in some form suitable for better usage or processing. Data is measured, collected and reported, and analyzed, whereupon it can be visualized using graphs, images or other analysis tools (Wikipedia).

DIGITAL COMMUNICATION

Communication using digital technology. Various modes of communication exist, e.g. synchronous communication (real time communication, e.g. using skype or video chat or Bluetooth) and asynchronous ones (not concurrent communication, e.g. email, sms) using for example, one-to-one, one-to-many, or many-to-many modes.

DIGITAL COMPETENCE

Digital competence can be broadly defined as the confident, critical and creative use of ICT to achieve goals related to work, employability, learning, leisure, inclusion and/or participation in society.

Source: *DigComp Framework* https://ec.europa.eu/jrc/digcomp

DIGITAL CONTENT

Any type of content that exists in the form of digital data that are encoded in a machine-readable format, and can be created, viewed, distributed, modified and stored using digital technologies. Examples of digital content include: web pages and websites, social media, data and databases, digital audio, such as mp3s, and e-books, digital imagery, digital video, video games, computer programmes and software. For the DigCompEdu framework, digital content is divided into digital resources and data.

DIGITAL ENVIRONMENT

A context, or a "place", that is enabled by technology and digital devices, often transmitted over the internet, or other digital means, e.g. mobile phone network. Digital environments are usually used for interaction with other users and for accessing and publishing user-created content. Records and evidence of an individual's interaction with a digital environment constitute their *digital footprint*.

DIGITAL RESOURCES

The term usually refers to any content published in computer-readable format. For the purposes of DigCompEdu, a distinction is made between digital resources and data. Digital resources in this respect comprise any kind of digital content that is immediately understandable to a human user, whereas data need to be analysed, treated and/or interpreted to be of use for educators.

DIGITAL SERVICES

Services that can be delivered through digital communication, e.g. internet, mobile phone network, that might include delivery of digital information (e.g. data, content) and/or transactional services. They can be either public or private, e.g. e-government, digital banking services, e-commerce, music services (e.g. Spotify), film/TV services (e.g. Netflix).

DIGITAL TECHNOLOGY

Any product or service that can be used to create, view, distribute, modify, store, retrieve, transmit and receive information electronically in a digital form. In this framework, the term "digital technologies" is used as the most general concept, comprising

- computer networks (e.g. the internet) and any online service supported by these (e.g. websites, social networks, online libraries, etc.),
- any kind of software (e.g. programmes, apps, virtual environments, games), whether networked or installed locally;
- any kind of hardware or "device" (e.g. personal computers, mobile devices, digital whiteboards); and
- any kind of digital content, e.g. files, information, data.

For the purposes of the DigCompEdu framework, the category of digital technologies is broken down into the following areas: Digital devices; digital resources (=digital files + software + online services); data.

DIGITAL TOOLS

Digital technologies used for a given purpose or for carrying out a particular function of e.g. information processing, communication, content creation, safety or problem solving.

EDUCATIONAL CONTENT

(Digital) content relevant, in one way or another, to the educational context. This term is broader than "educational resource" in that it also comprises content marginal to the instructional process, e.g. communication with students, parents, colleagues; administrative content, etc.

EDUCATIONAL RESOURCES

Resources (digital or not) designed and intended to be used for educational purposes.

EDUCATOR

In the context of DigCompEdu, the term "educator" is used to generically refer to any person involved in the process of teaching or transmitting knowledge. In particular, it refers to teachers at all levels of formal education, ranging from pre-primary, primary and secondary, to further and higher education (e.g. university lecturers), to vocational and adult education, and including initial training and continuous professional development. It may, by analogy, also be used to describe people involved in providing training in non-formal and informal settings, e.g. social workers, library staff, parents providing home schooling, etc.

E-PORTFOLIOS

Collections of (students') work that can advance learning by providing a way for them to organize, archive, display and reflect on their work. E-portfolios are both demonstrations of users' abilities and platforms for their self-expression.

FORMATIVE ASSESSMENT

Formative assessment refers to a wide variety of methods that teachers use to conduct in-process evaluations of students' comprehension, learning needs, and academic progress during a lesson, unit, or course. The general goal of formative assessment is to collect detailed information that can be used to improve instruction and student learning while it is happening.

Source: Glossary of Education Reform http://edglossary.org/formative-assessment/

LEARNING ANALYTICS

Learning analytics is the measurement, collection, analysis and reporting of data about learners and their contexts, for the purposes of understanding and optimising learning and the environments in which it occurs.

Source: Definition adopted at the First International Conference on Learning Analytics. http://edutechwiki.unige.ch/en/Learning_analytics

LEARNING OUTCOMES

Learning outcomes are defined as the knowledge, skills and competences that people have acquired as a result of learning and that can be demonstrated if needed in a recognition process. According to the European Qualifications Framework (EQF) learning outcomes are statements of what a learner knows, understands and is able to do on completion of a learning process.

Source: http://www.eucen.eu/sites/default/files/OECD_RNFIFL2010_Werquin.pdf

OPEN EDUCATIONAL RESOURCES

Teaching, learning and research materials in any medium, digital or otherwise, that are in the public domain or have been released under an open license that permits no-cost access, use, adaptation and redistribution by others with no or limited restrictions.

Source: UNESCO definition http://www.unesco.org/new/en/communication-and-information/access-to-knowledge/open-educational-resources/what-are-open-educational-resources-oers/

PEER-ASSESSMENT

Peer assessment is a process whereby students grade each others' assignments or tests, based on a teacher's benchmarks. The practice is employed to save teachers time and improve students' understanding of course materials and to improve their metacognitive skills. Peer assessment can empower students to take responsibility for, and manage, their own learning; enable students to learn to assess and to develop life-long assessment skills; enhance students' learning through knowledge diffusion and exchange of ideas; motivate students to engage with course material more deeply.

Source: Adapted from Wikipedia;
Cornell University Centre for Teaching Excellence, http://www.cte.cornell.edu/

SELF-ASSESSMENT

Self-assessment involves the ability to be a realistic judge of one's own performance. Proponents of self-assessment suggest it has many advantages, for example, it: provides timely and effective feedback and allows students to assess their own learning quickly; allows instructors to understand and provide quick feedback on learning; promotes academic integrity through student self-reporting of learning progress; promotes the skills of reflective practice and self-monitoring; develops self-regulated learning; increases student motivation; improves

satisfaction from participating in a collaborative learning environment; helps students develop a range of personal, transferrable skills to meet the expectations of future employers.

Source: *Cornell University Centre for Teaching Excellence* http://www.cte.cornell.edu/

SELF-ASSESSMENT TOOL

A self-assessment tool is an instrument that assists professionals in their self-assessment, i.e. in evaluating the effectiveness of their performance in all areas of responsibility, and determining what improvements are required (**Adapted from:** http://www.businessdictionary.com/definition/self-assessment.html). Within this report the term is used to refer to online programmes in the form of questionnaires which allow teachers to evaluate their digital competence with the help of a set of questions. Usually feedback in the form of a report is provided, identifying areas of strength and areas for development.

SELF-DETERMINED LEARNING

"A process in which learners take initiative for identifying learning needs, formulating learning goals, identifying learning resources, implementing problem-solving strategies, and reflecting upon the learning processes to challenge existing assumptions and increase learning capabilities." (Blaschke, 2012; http://www.rtschuetz.net/2014/12/self-directed-vs-self-determined.html). The concept is related to the concepts of self-directed and self-regulated learning. Of these three it is the most demanding on the level of learner autonomy. Since such a high level of autonomy may be too ambitious for some learning and teaching contexts or learner groups, in DigCompEdu the concept of self-regulated learning is given preference.

SELF-DIRECTED LEARNING

Describes "a process in which individuals take the initiative, with or without the help of others, in diagnosing their learning needs, formulating learning goals, identifying human and material resources for learning, choosing and implementing appropriate learning strategies, and evaluating learning outcomes". (Knowles, 1975, p. 18; http://infed.org/mobi/self-directed-learning/). The concept is related to the concepts of self-regulated and self-determined learning. With respect to the level of learner autonomy, self-regulated learning is less demanding whereas self-determined learning is more demanding. For DigCompEdu, the concept of self-regulated learning is given preference as the other two may be too ambitious for some learning and teaching contexts or learner groups.

SELF-REGULATED LEARNING

Refers to learning that is guided by metacognition (thinking about one's thinking), strategic action (planning, monitoring, and evaluating personal progress against a standard), and motivation to learn. "Self-regulated" describes a process of taking control of and evaluating one's own learning and behaviour. (Wikipedia) The concept is related to the concepts of self-directed and self-determined learning. Since the latter two require a higher degree of autonomy, not feasible in all educational contexts, for DigCompEdu the concept of "self-regulated learning" is given preference.

TEACHER

A teacher is a person who provides education for students in formal education, i.e. within an educational institution. Since the term is often taken to only refer to school education (i.e. ISCED1-3), for DigCompEdu the wider term "educator" is used.

SUMMATIVE ASSESSMENT

Summative assessments are used to evaluate student learning, skill acquisition, and academic achievement at the conclusion of a defined instructional period - typically at the end of a project, unit, course, semester, programme, or school year. Summative-assessment results are often recorded as scores or grades that are then factored into a student's permanent academic record.

Source: *The Glossary of Education Reform* http://edglossary.org/summative-assessment/

VLE (VIRTUAL LEARNING ENVIRONMENT)

A virtual learning environment (VLE) is a web-based platform for the digital aspects of courses of study, usually within educational institutions. VLEs typically: allow participants to be organized into cohorts, groups and roles; present resources, activities and interactions within a course structure; provide for the different stages of assessment; report on participation; and have some level of integration with other institutional systems. (Wikipedia).

TABLE 9: GLOSSARY OF TECHNICAL TERMS USED IN THE DIGCOMPEDU FRAMEWORK

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