DEVELOPMENT OF A COMPETENCE FRAMEWORK TO FACILITATE A SWIFT TO A DISTANCE/ HYBRID LEARNING MODEL

Output 1 Report

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Empowering schools' transition readiness to a distance/hybrid learning model enhanced by cloud technology tools

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Purpose of this document

The purpose of this document is to record the process of the development of the competence framework to facilitate a swift to a distance/hybrid learning model in the context of the implementation of Output 1 of the ETRe Project.

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Contents

Analysation of chosen existing competence frameworks

Overview of chosen competence frameworks

This part of the document identifies the key competence areas of the chosen frameworks and focuses the areas that relate with the digital competences.

1. DigiComp 2.1

Available here.

General Information

The European Digital Competence Framework for Citizens, known as DigiComp was developed by JRC (Joint Research Centre – The Europan Commission's science and knowledge service) on behalf of the DG EAC (Directorate General for Education and Culture) and later on behalf of DG EMPL (Directorate-General for Employment, Social Affairs and Inclusion). The current version is DigiComp2.1. and aims to offers a tool to improve citizens' digital competence.

Teachers are included within the framework's target audience.

Competence Areas

Identified competence areas:

- Information and Data Literacy
- Communication and Collaboration
- Digital Content Creation
- Safety
- Problem solving

The following set of competences are identified for each area:

INFORAMATION AND DATA LITERACY

- Browsing, searching and filtering data, information and digital content
- Evaluating data, information and digital content
- Managing data, information and digital content

COMMUNICATION AND COLLABORATION

- Interacting through digital technologies
- Sharing through digital technologies
- Engaging in citizenship through digital technologies
- Collaborating through digital technologies
- Netiquette
- Managing digital identity

DIGITAL CONTENT CREATION

- Developing digital content

- Integrating and re-elaborating digital content
- Copyright and licences
- Programming

SAFETY

- Protecting devices
- Protecting personal data and privacy
- Protecting health and well-being
- Protecting the environment

PROBLEM SOLVING

- Solving technical problems
- Identifying needs and technological responses
- Creatively using digital technologies
- Identifying digital competence gaps

Competences Table

In the table below, the examples refer to the highest level of proficiency (mastery) based on the levels suggested by the framework.

DigiComp 2.1 Competences

1. Information and data literacy	1.1. Browsing, searching, filtering data, information and digital content	To create solutions to solve complex problems with many interacting factors that are related to browsing, searching and filtering data, information and digital content.
		To propose new ideas and processes to the field.
	1.2 Evaluating data, information and digital content	To create solutions to solve complex problems with many interacting factors that are related to analysing and evaluating credible and reliable sources of data, information and content in digital environments.
		To propose new ideas and processes to the field.
	1.3 Managing data, information and digital content	To create solutions to solve complex problems with many interacting factors that are related to managing data, information, and content for their organisation, storage and retrieval in a structured digital environment.
		To propose new ideas and processes to the field.
2. Communication and collaboration	2.1 Interacting through digital technologies	To create solutions to solve complex problems with many interacting factors that are related to interacting through digital technologies and digital communication means
		To propose new ideas and processes to the field.
	2.2 Sharing through digital technologies	To create solutions to solve complex problems with many interacting factors that are related to sharing through digital technologies.
		To propose new ideas and processes to the field.
	2.3 Engaging in citizenship through digital technologies	To create solutions to solve complex problems with many interacting factors that are related to engaging in citizenship through digital technologies.
		To propose new ideas and processes to the field.
	2.4 Collaborating through digital technologies	To create solutions to solve complex problems with many interacting factors that are related to using collaborative processes and co-construction and co-creation of data, resources and knowledge through digital tools and technologies.
		To propose new ideas and processes to the field.
	2.5 Netiquette	To create solutions to solve complex problems with many interacting factors that are related to digital etiquettes respectful to different audiences and cultural and generational diversity.

		To propose new ideas and processes to the field.
	2.6 Managing digital identity	To create solutions to solve complex problems with many interacting factors that are related to managing digital identities and protection of people's online reputation.
		To propose new ideas and processes to the field.
3. *Digital content creation*	3.1 Developing digital content	To create solutions to solve complex problems with many interacting factors that are related to content creation and edition in different formats, and self-expression through digital means.
		To propose new ideas and processes to the field.
	3.2 Integrating and re-elaborating digital content	To create solutions to solve complex problems with many interacting factors that are related to modifying, refining, improving and integrating new content and information into existing knowledge to create new and original ones.
		To propose new ideas and processes to the field.
	3.3 Copyright and licences	To create solutions to solve complex problems with many interacting factors that are related to applying copyright and licenses to data, digital information and content.
		To propose new ideas and processes to the field.
	3.4 Programming	To create solutions to solve complex problems with many interacting factors that are related to planning and developing instructions for a computing system and performing a task using a computing system.
		To propose new ideas and processes to the field.
4. *Safety*	4.1 Protecting devices	To solve complex problems with many interacting factors that are related to protecting devices and digital content, managing risks and threats, applying safety and security measures, and reliability and privacy in digital environments.
		To propose new ideas and processes to the field.
	4.2 Protecting personal data and privacy	To create solutions to solve complex problems with many interacting factors that are related to protecting personal data and privacy in digital environments, using and sharing personally identifiable information protecting self and others from dangers, and privacy policies to
		To propose new ideas and processes to the field.
	4.3 Protecting health and well-being	To create solutions to solve complex problems with many interacting factors that are related to avoiding health -risks and threats to well-being while using digital technologies, to protect self and others from dangers in digital environments, and to the use of digital technologies for social well -being and social inclusion.
		To propose new ideas and processes to the field.
	4.4 Protecting the environment	To create solutions to solve complex problems with many interacting factors that are related to protecting the environment from the impact of digital technologies and their use.
		To propose new ideas and processes to the field.
5. *Problem solving*	5.1 Solving technical problems	To create solutions to solve complex problems with many interacting factors that are related to technical problems when operating devices and using digital environments.
		To propose new ideas and processes to the field.
	5.2 Identifying needs and technological responses	To create solutions to solve complex problems with many interacting factors using digital tools and possible technological responses, and to adapt and customise digital environments to personal needs.
		To I can propose new ideas and processes to the field.
	5.3 Creatively using digital technologies	To create solutions to solve complex problems with many interacting factors using digital tools
		To propose new ideas and processes to the field.
	5.4 Identifying digital competence gaps	To create solutions to solve complex problems with many interacting factors that are related to improving digital competence, and to find opportunities for self -development and to keep up-to-date with the digital evolution.
		To propose new ideas and processes to the field.

Table 1. Data Source: DigiComp 2.1

Levels of Proficiency

The levels of proficiency of each competent based on the DigiComp2.1 are presented in the table below:

Levels in DigComp 1.0	Levels in DigComp 2.1	Complexity of tasks	Autonomy	Cognitive domain
Foundation	1	Simple tasks	With guidance	Remembering
	2	Simple tasks	Autonomy and with guidance where needed	Remembering
Intermediate	3	Well-defined and routine tasks, and straightforward problems	On my own	Understanding
	4	Tasks, and well-defined and non-routine problems	Independent and according to my needs	Understanding
Advanced	5	Different tasks and problems	Guiding others	Applying
	6	Most appropriate tasks	Able to adapt to others in a complex context	Evaluating
Highly specialised	7	Resolve complex problems with limited solutions	Integrate to contribute to the professional practice and to guide others	Creating
	8	Resolve complex problems with many interacting factors	Propose new ideas and processes to the field	Creating

Table 2. Source: DigiComp 2.1

2. UNESCO – Digital Literacy Global Framework

**linked with DigiComp.* Available here. P. 23

General Information

The Global Framework of Reference on Digital Literacy Skills Indicator 4.4.2, developed by the UNESCO Institute of Statistics, in the context of the Digital Literacy Global Framework (DLGF) project, aims to

develop a methodology to address the Sustainable Development Goal (SDG) thematic Indicator 4.4.2: "Percentage of youth/adults who have achieved at least a minimum level of proficiency in digital literacy skills". The framework builds on the European Commission's Digital Competence Framework for Citizens (DigComp 2.0).

Teachers are included within the framework's target audience.

Competence Areas

The framework identifies the following competence areas:

- Devices and software operations
- Information and data literacy
- Communication and Collaboration
- Digital Content Creation
- Safety
- Problem-solving
- Career-related competences

The following set of competences are identified for each competence area:

DEVICES AND SOFTWARE OPERATIONS

To identify and use hardware tools and technologies. To identify data, information and digital content needed to operate software tools and technologies.

- Physical operations of digital devices
- Software operations in digital devices

INFORMATION AND DATA LITERACY

To articulate information needs, to locate and retrieve digital data, information and content. To judge the relevance of the source and its content. To store, manage and organise digital data, information and content.

- Browsing, searching and filtering data, information and digital content
- Evaluating data, information and digital content
- Managing data, information and digital content

COMMUNICATION AND COLLABORATION

To interact, communicate and collaborate through digital technologies while being aware of cultural and generational diversity. To participate in society through public and private digital services and participatory citizenship. To manage one's digital identity and reputation.

- Interacting through digital technologies
- Sharing through digital technologies
- Engaging in citizenship through digital technologies
- Collaborating through digital technologies
- Netiquette
- Managing digital identity

DIGITAL CONTENT CREATION

To create and edit digital content. To improve and integrate information and content into an existing body of knowledge while understanding how copyright and licenses are to be applied. To know how to give understandable instructions for a computer system.

- Developing digital content
- Integrating and re-elaborating digital content
- Copyright and licences
- Programming

SAFETY

To protect devices, content, personal data and privacy in digital environments. To protect physical and psychological health, and to be aware of digital technologies for social well-being and social inclusion. To be aware of the environmental impact of digital technologies and their use.

- Protecting devices
- Protecting personal data and privacy
- Protecting health and well-being
- Protecting the environment

PROBLEM SOLVING

To identify needs and problems and to resolve conceptual problems and problem situations in digital environments. To use digital tools to innovate processes and products. To keep up to date with the digital evolution.

- Solving technical problems
- Identifying needs and technological responses
- Creatively using digital technologies
- Identifying digital competence gaps
- Computational thinking

CAREER RELATED COMPETENCES

To operate specialised digital technologies and to understand, analyse and evaluate specialised data, information and digital content for a particular field.

- Operating specialised digital technologies for a particular field
- Interpreting and manipulating data, information and digital content for a particular field

Competences Table

The competence areas are analysed into competences as presented in the following table:

Digital Literacy Global Framework Competences

0. Devices and software operations	0.1 Physical operations of digital devices	To identify and use the functions and features of the hardware tools and technologies.
	0.2 Software operations in digital devices	To know and understand the data, information and/or digital content that are needed to operate software tools and technologies.
1. Information and data literacy	1.1 Browsing, searching and filtering data, information and digital content	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.
	1.2 Evaluating data, information and digital content	To analyse, compare and critically evaluate the credibility and reliability of sources of data, information and digital content. To analyse, interpret and critically evaluate the data, information and digital content.
	1.3 Managing data, information and digital content	To organise, store and retrieve data, information and content in digital environments. To organise and process them in a structured environment.
2. Communication and collaboration	2.1 Interacting through digital technologies	To interact through a variety of digital technologies and to understand appropriate digital communication means for a given context.
	2.2 Sharing through digital technologies	To share data, information and digital content with others through appropriate digital technologies. To act as an intermediary, to know about referencing and attribution practices.
	2.3 Engaging in citizenship through digital technologies	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.
	2.4 Collaborating through digital technologies	To use digital tools and technologies for collaborative processes and for co-construction and co-creation of resources and knowledge.
	2.5 Netiquette	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.
	2.6 Managing digital identity	To create and manage one or multiple digital identities, to be able to protect one's own reputation, to deal with the data that one produces through several digital tools, environments and services.
3. Digital content creation	3.1 Developing digital content	To create and edit digital content in different formats, to express oneself through digital means.
	3.2 Integrating and re-elaborating digital content	To modify, refine, improve and integrate information and content into an existing body of knowledge to create new, original and relevant content and knowledge.
	3.3 Copyright and licences	To understand how copyright and licences apply to data, information and digital content.
	3.4 Programming	To plan and develop a sequence of understandable instructions for a computing system to solve a given problem or perform a specific task.
4. Safety	4.1 Protecting devices	To protect devices and digital content, and to understand risks and threats in digital environments. To know about safety and security measures and to have due regard to reliability and privacy.
	4.2 Protecting personal data and privacy	To protect personal data and privacy in digital environments. To understand how to use and share personally identifiable information while being able to protect oneself and others from damages. To understand that digital services use a “Privacy policy” to inform how personal data is used.
	4.3 Protecting health and well-being	To be able to avoid health-risks and threats to physical and psychological well-being while using digital technologies. To be able to protect oneself and

		others from possible dangers in digital environments (e.g. cyber bullying). To be aware of digital technologies for social well-being and social inclusion.
	4.4 Protecting the environment	To be aware of the environmental impact of digital technologies and their use.
5. Problem-solving	5.1 Solving technical problems	To identify technical problems when operating devices and using digital environments, and to solve them (from trouble shooting to solving more complex problems).
	5.2 Identifying needs and technological responses	To assess needs and to identify, evaluate, select and use digital tools and possible technological responses to solve them. To adjust and customise digital environments to personal needs (e.g. accessibility).
	5.3 Creatively using digital technologies	To use digital tools and technologies to create knowledge and to innovate processes and products. To engage individually and collectively in cognitive processing to understand and resolve conceptual problems and problem situations in digital environments.
	5.4 Identifying digital competence gaps	To understand where one's own digital competence needs to be improved or updated. To be able to support others with their digital competence development. To seek opportunities for self-development and to keep up to date with the digital evolution.
	5.5 Computational thinking	To process a computable problem into sequential and logical steps as a solution for human and computer systems.
6. Career-related competences	6.1 Operating specialised digital technologies for a particular field	To identify and use specialized digital tools and technologies for a particular field.
	6.2 Interpreting and manipulating data, information and digital content for a particular field	To understand, analyse and evaluate specialised data, information and digital content for a particular field within a digital environment.

Table 3. Data Source: A Global Framework of References on Digital Literacy Skills for Indicator 4.4.2

3. Microsoft 21s Learning Design Competence Framework

General Information

Microsoft's aim through the introduction of the 21st Century Learning Design (CLD) Competence Framework is to:

- To focus on redesigning learning to develop 21st century skills and deepen understanding of 21CLD curricular goals
- To facilitate educators to use new learning designs within their own teaching and to analyse the impact on student learning
- To enable educators to develop and implement learning activities

Microsoft competence framework describes the skills a student needs to develop to succeed in the globalised, knowledge-based world of today. Teachers need to also develop these competences in order to optimally facilitate the development of learning activities that aim to enhance, the framework's focus competences, of students.

Competence Areas

- Collaboration
- Real World Problem Solving and Innovation
- Skilled Communication

- Knowledge Construction
- Self-Regulation
- Use of ICT for learning

COLLABORATION

- Working together
- Shared Responsibility
- Substantive decisions
- Interdependent work

REAL-WORLD PROBLEM SOLVING

- Problem Solving
- Real-World Problem Solving
- Innovation

SKILLED COMMUNICATION

- Extended communication
- Multi-modal communication
- Supporting evidence
- Design for a particular audience

KNOWLEDGE CONSTRUCTION

- Knowledge construction
- Application of knowledge

SELF-REGULATION

- Planning own work
- Revise work based on feedback

USE OF ICT FOR LEARNING

- Use of ICT
- Use of ICT for knowledge construction
- Design of ICT products

Competences Table

Microsoft's 21st Century Learning Skills

1. Collaboration	1.1 Working Together	To discuss an issue
		To work together
		To create a product
	1.2 Shared responsibility	To work in pairs or groups to develop a common product, design, or response
		To collectively own the work and be mutually responsible for its outcome
	1.3 Substantive decisions	To use their knowledge of an issue to make a decision that affects the academic content of their work together
		To plan what they will do, when to do it, what tools they will use, or the roles and responsibilities of people on the team.
		To make fundamental design decisions that affect the nature and usability of their product.
	1.4 Interdependent work	To produce an interdependent product or other interdependent product
		To be responsible for a task that he or she must complete in order for the group to do its work.
		To work together to produce the final product or outcome.
2. Real World Problem Solving	2.1 Problem Solving	To develop a solution to a problem that is new to them OR to complete a task that they have not been instructed how to do OR to design a complex product that meets a set of requirements.
		To investigate the parameters of the problem to guide their approach.
		To generate ideas and alternatives.
		To devise their own approach, or explore several possible procedures that might be appropriate to the situation
		To design a coherent solution
		To test the solution and iterate on improvements to satisfy the requirements of the problem.
	2.2 Real-World Problem	To find solution to a problem experienced by real people
		To use actual data
	2.3 Innovation	To put ideas or solutions into practice in the real world
3. Skilled Communication	3.1 Extended Communication	To produce communication that represents a set of connected ideas, not a single simple thought
	3.2 Multi-modal Communication	To engage in more than one type of communication mode or tool used to communicate a coherent message.
	3.3 Supporting Evidence	To explain their ideas or support their thesis with facts or examples.
		To support the claim with sufficient evidence
	3.4 Design for a particular audience	To ensure that their communication is appropriate to the specific readers, listeners, viewers, or others with whom they are communicating.
		To select the tools, content, or style that they use to reach the audience.
4. Knowledge Construction	4.1 Knowledge Construction	To interpret information or ideas
		To analyse information or ideas
		To synthesise information or ideas
		To evaluate information or ideas
	4.2 Application of Knowledge	To use the knowledge, they have constructed to support another knowledge construction task in a new context.
		To use interpretation, analysis, synthesis, or evaluation to decide how to use what they have learned in a new context.
5. Self-Regulation	5.1 Planning own work	To break down a complex task into simpler sub-tasks, or choose the tools they will use.
		To create a schedule for their work and setting interim deadlines.
		To determines how to divide work among themselves.
		To decide what pieces of the work will be done and where.
	5.2 Revise Work Based on Feedback	To improve the work based on feedback before submitting or finalising it.
		To revise their work based on their own deliberate process of self-reflection.
6.	6.1 Use of ICT	To use ICT directly to complete all or part of the learning activity.
		To have control over the ICT use

6.2 Use of ICT for knowledge construction	To use ICT in ways that support knowledge construction, either directly or indirectly.
	To engage in knowledge construction activities that would be impossible or impractical without the use of the ICT
6.3 Design of ICT products	To create ICT products that others can use.
	To design ICT to support their real-world problem-solving and innovation.

Table 5. Data Source: Microsoft's 21st CLD course OneNote

4. DigiCompEdu

Available here.

General Information

The European Digital Competence Framework for Citizens, known as DigiComp was developed by JRC (Joint Research Centre – The Europan Commission's science and knowledge service) on behalf of the DG EAC (Directorate General for Education and Culture) and later on behalf of DG EMPL (Directorate-General for Employment, Social Affairs and Inclusion). The JRC developed DigiCompEdu as part of related capacity building for the digital transformation of education and learning and for changing requirements on skills and 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.

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.

Competence Areas

The main identified competence areas are:

- Professional Engagement
- Digital Resources
- Teaching and Learning
- Assessment
- Empowering Learners
- Facilitating Learners' Digital Competences

The competences presented for each area are the following:

PROFESSIONAL ENGAGEMENT

Using digital technologies for communication, collaboration and professional development.

- Ogranisational Communication
- Professional Collaboration
- Reflective Practice
- Digital CPD

DIGITAL RESOURCES

Sourcing, creating, and sharing digital resources.

- Selecting
- Creating and Modifying
- Managing, Protecting, and Sharing

TEACHING AND LEARNING

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

- Teaching
- Guidance
- Collaborative Learning
- Self-regulated Learning

ASSESSMENT

Using digital technologies and strategies to enhance assessment.

- Assessment strategies
- Analysing evidence
- Feedback and Planning

EMPOWERING LEARNERS

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

- Accessibility and Inclusion
- Differentiation and Personalisation
- Actively Engaging Learners

FACILITATING LEARNERS' DIGITAL COMPETENCES

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

- Information and Media Literacy
- Communication
- Content Creation
- Responsible Use
- Problem Solving

Competences Table

The competence areas are analysed at a competence level as shown in the following table:

DigiCompEdu Competences

1. *Professional Engagement*	1.1 Ogranisational Communication	To use digital technologies to enhance organizational 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 experience, 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 CPD	To use digital sources and resources for continuous professional development.
2. *Digital Resources*	2.1 Selecting	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	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, Sharing	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 strategies.
		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 learners' selfregulated 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.
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 Learne*	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 Communication	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 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 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 5. Data Source: DigiCompEdu

Competence stages

The DigiCopmEdu Framework distinguishes the following competence stages for educators:

1. *Newcomer:* 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.
2. *Explorer:* 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.
3. *Integrator:* 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.
4. *Expert:* 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.

5. *Leader:* 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.
6. *Pioneer:* 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.

5. DQ Framework - Global Standards for Digital Literacy, Skills, and Readiness

Available here.

General Information

The Digital Intelligence (DQ) framework was developed by the DQ Institute presented in the DQ Global Standards Report 2019 – Common Framework for Digital Literacy, Skills and Readiness, suggests a set of technical, cognitive, meta-cognitive, and socio-emotional competencies aiming to enable individuals to face the challenges and identify and utilise the opportunities of digital life. The DQ framework consists of 3 levels, 8 areas, and 24 competencies composed of knowledge, skills, attitudes, and values.

Teachers are included within the framework's target audience.

Competence Areas

The framework focuses on digital skills and does not present any other competence areas. The main digital competences areas identified are:

- Digital rights
- Digital literacy
- Digital Communication
- Digital Emotional Intelligence
- Digital Security
- Digital safety
- Digital Use
- Digital identity

The competences presented for each area are the following:

DIGITAL RIGHTS:

The ability to understand and uphold human rights and legal rights when using technology. Guiding Principle: Respect for rights

- Participatory Rights Management
- Intellectual Property Rights Management
- Privacy Management

DIGITAL LITERACY

The ability to find, read, evaluate, synthesize, create, adapt, and share information, media, and technology. Guiding Principle: Respect for knowledge

- Data and AI Literacy
- Content Creation and Computational Literacy
- Media and Information Literacy

DIGITAL COMMUNICATION

The ability to communicate and collaborate with others using technology. Guiding Principle: Respect for reputation and relationships.

- Public and Mass Communication
- Online Communication and Collaboration
- Digital Footprint Management

DIGITAL EMOTIONAL INTELLIGENCE

The ability to recognize, navigate, and express emotions in one's digital intra- and inter-personal interactions. Guiding Principle: Respect for others

- Relationship Management
- Self-Awareness and Management
- Digital Empathy

DIGITAL SECURITY

The ability to detect, avoid, and manage different levels of cyber threats to protect data, devices, networks, and systems. Guiding Principle: Respect for property

- Personal Cyber Security Management
- Network Security Management
- Organisational Cyber Management

DIGITAL SAFETY

The ability to understand, mitigate and manage various cyber-risks through safe, responsible, and ethical use of technology. Guiding Principle: Respect for life

- Behavioral Cyber-Risk Management
- Content Cyber-Risk Management
- Commercial and Community Cyber-Risk Management

DIGITAL USE

The ability to use technology in a balanced, healthy, and civic way. Guiding Principle: Respect for time and the environment

- Balanced Use of Technology
- Healthy Use of Technology
- Civic Use of Technology

DIGITAL IDENTITY

The ability to build a wholesome online and offline identity. Guiding Principle: Respect for oneself

- Digital Citizen Identity
- Digital Co-Creator Identity
- Digital Changemaker Identity

The digital skills are presented in the figure below:

Figure 1. source: [DQ Global Standards Report 2019 – Common Framework for Digital Literacy, Skills and Readiness]

Competences Table

The competence areas are analysed, by the framework, as presented in the table below:

DQ Competence Framework

Digital Identity	Digital Citizen Identity	The ability to build and manage a healthy identity as a digital citizen with integrity.
	Digital Co-Creator	The ability to identify and develop oneself as a co-creator of the digital ecosystem.
	Digital Changemaker Identity	The ability to identify and develop oneself as a competent changemaker in the digital economy.
Digital Use	Balanced Use of Technology	The ability to manage one's life both online and offline in a balanced way by exercising self -control to manage screen time, multitasking, and one's engagement with digital media and devices.
	Healthy Use of Technology	The ability to understand the benefits and harms of technology on one's mental and physical health and to use technology use while prioritizing health and well -being.
	Civic Use of Technology	The ability to engage in civic participation for the well-being and growth of local, national, and global communities using technology.
Digital Safety	Behavioral Cyber-Risk Management	The ability to identify, mitigate, and manage cyber-risks (e.g., cyberbullying, harassment, and stalking) that relate to personal online behaviors.
	Content Cyber-Risk Management	The ability to identify, mitigate, and manage content cyber-risks online (e.g., harmful user generated content, racist/hateful content, image-based abuse).
	Commercial and Community Cyber-Risk Management	The ability to identify, mitigate, and manage commercial or community cyber-risks online, such as organizational attempts to exploit individuals financially or through ideological persuasion (e.g., embedded marketing, online propaganda, and gambling).
Digital Security	Personal Cyber Security Management	The ability to detect cyber threats (e.g., hacking, scams, and malware) against personal data and device, and to use suitable security strategies and protection tools.
	Network Security Management	The ability to detect, avoid, and manage cyber threats to cloud based collaborative digital environments.
	Organizational Cyber Security Management	The ability to recognize, plan, and implement organizational cyber security defenses.
Digital Emotional Intelligence	Digital Empathy	The ability to be aware of, be sensitive to, and be supportive of one's own and other's feelings, needs and concerns online.
	Self-Awareness and Management	The ability to recognize and manage how one's value system and digital competencies fits with one's digital environment.
	Relationship Management	The ability to skillfully manage one's online relationships through cooperation, conflict management, and persuasion.

Digital Communication	Digital Footprint Management	The ability to understand the nature of digital footprints and their real-life consequences, to manage them responsibly, and to actively build a positive digital reputation.
	Online Communication and Collaboration	The ability to use technology effectively to communicate and collaborate collectively, including at a distance.
	Public and Mass Communication	The ability to communicate with an online audience effectively to exchange messages, ideas, and opinions reflecting wider business or societal discourses.
Digital Literacy	Media and Information Literacy	The ability to find, organize, analyze, and evaluate media and information with critical reasoning.
	Content Creation and Computational Literacy	The ability to synthesize, create, and produce information, media, and technology in an innovative and creative manner.
	Data and AI Literacy	The ability to generate, process, analyze, present meaningful information from data and develop, use, and apply artificial intelligence (AI) and related algorithmic tools and strategies in order to guide informed, optimized, and contextually relevant decision-making processes.
Digital Rights	Privacy Management	The ability to handle with discretion all personal information shared online to protect one's and others' privacy.
	Intellectual Property Rights Management	The ability to understand and manage intellectual property rights (e.g., copyrights, trademarks, and patents) when using and creating content and technology.
	Participatory Rights Management	The ability to understand and exercise one's powers and right to online participation (e.g., their rights to personal data protection, freedom of expression, or to be forgotten)

Table 6. Data Source: DQ Global Standards Report 2019 – Common Framework for Digital Literacy, Skills and Readiness

Levels of competences

The framework suggests three levels of competences, from basic to more advance as follows:

- Digital Citizenship: The ability to use digital technology and media in safe, responsible, and ethical ways.
- Digital Creativity: The ability to become a part of the digital ecosystem, and to create new knowledge, technologies, and content to turn ideas into reality.
- Digital Competitiveness: The ability to solve global challenges, to innovate, and to create new opportunities in the digital economy by driving entrepreneurship, jobs, growth and impact.

The levels of competences relate to the competence areas and competences as presented in the following figure:

Figure 2. source: [DQ Global Standards Report 2019 – Common Framework for Digital Literacy, Skills and Readiness]

6. Partnership for 21st century skills - Framework of the 21st Century Skills

Available here, more info (here).

General Information

The Framework for 21st century skills, developed by the Partnership for 21st Century Skills, describes the skills, knowledge and expertise students must master to succeed in work and life; it is a blend of content knowledge, specific skills, expertise and literacies. For teachers to support students in developing specific digital competences, enabling them to successfully adapt to a distance or hybrid digital learning environment, they need themselves to first acquire an adequate level of mastery of those competences.

Competence Areas

The main competence areas identified by the Framework of the 21st century skills are:

- Learning and Innovation skills
- Information Media and Technology skills (Information literacy, Media literacy, ICT literacy)
- Life and Career skills

Focusing on the digital skills, the framework suggests that people in the 21st century live under a technology and media-suffused environment. Some of the characteristics marking this environment are:

- access to an abundance of information,
- rapid changes in technology tools, and

- the ability to collaborate and make individual contributions on an unpresented scale.

The framework identifies the following functional and critical thinking skills related to information media and technology:

INFORMATION LITERACY

Access and Evaluate Information

- Access information efficiently (time) and effectively (sources)
- Evaluate information critically and competently

Use and Manage Information

- Use information accurately and creatively for the issue or problem at hand
- Manage the flow of information from a wide variety of sources
- Apply a fundamental understanding of the ethical/legal issues surrounding the access and use of information

MEDIA LITERACY

Analyze Media

- Understand both how and why media messages are constructed, and for what purposes
- Examine how individuals interpret messages differently, how values and points of view are included or excluded, and how media can influence beliefs and behaviors
- Apply a fundamental understanding of the ethical/legal issues surrounding the access and use of media

Create Media Products

- Understand and utilize the most appropriate media creation tools, characteristics and conventions
- Understand and effectively utilize the most appropriate expressions and interpretations in diverse, multi-cultural environments

ICT (Information, Communications and Technology) LITERACY

Apply Technology Effectively

- Use technology as a tool to research, organize, evaluate and communicate information
- Use digital technologies (computers, PDAs, media players, GPS, etc.), communication/networking tools and social networks appropriately to access, manage, integrate, evaluate and create information to successfully function in a knowledge economy
- Apply a fundamental understanding of the ethical/legal issues surrounding the access and use of information technologies

Competences Table

The Information Media and Technology skills suggested by the framework are displayed in the following table:

Information Media and Technology skills

INFORMATION LITERACY	Access and Evaluate Information	Access information efficiently (time) and effectively (sources)
		Evaluate information critically and competently
	Use and Manage Information	Use information accurately and creatively for the issue or problem at hand
		Manage the flow of information from a wide variety of sources
		Apply a fundamental understanding of the ethical/legal issues surrounding the access and use of information
MEDIA LITERACY	Analyze Media	Understand both how and why media messages are constructed, and for what purposes
		Examine how individuals interpret messages differently, how values and points of view are included or excluded, and how media can influence beliefs and behaviors
		Apply a fundamental understanding of the ethical/legal issues surrounding the access and use of media
	Create Media Products	Understand and utilize the most appropriate media creation tools, characteristics and conventions
		Understand and effectively utilize the most appropriate expressions and interpretations in diverse, multi-cultural environments
ICT LITERACY	Apply Technology Effectively	Use technology as a tool to research, organize, evaluate and communicate information
		Use digital technologies (computers, PDAs, media players, GPS, etc.), communication/networking tools and social networks appropriately to access, manage, integrate, evaluate and create information to successfully function in a knowledge economy
		Apply a fundamental understanding of the ethical/legal issues surrounding the access and use of information technologies

Table 7

For the other two competence areas the competences identified are:

Learning and Innovation:

- Critical thinking and problem solving
- Creativity and innovation
- Communication
- Collaboration

Career and Life Skills:

- Flexibility and adaptability
- Initiative and self-direction
- Social & cross-cultural interaction
- Productivity and accountability
- Leadership and responsibility

Overview of Identified Competence Areas

The competence areas identified through the analysis of the competence frameworks are listed below and presented in table 8.

DigiComp2.1:

- Information and Data Literacy
- Communication and Collaboration
- Digital Content Creation
- Safety
- Problem solving

UNESCO:

- Devices and software operations
- Information and data literacy
- Communication and Collaboration
- Digital Content Creation
- Safety
- Problem-solving
- Career-related competences

MICROSOFT:

- Collaboration
- Real World Problem Solving and Innovation
- Skilled Communication
- Knowledge Construction
- Self-Regulation
- Use of ICT for learning

DigiCompEdu:

- Professional Engagement
- Digital Resources
- Teaching and Learning
- Assessment
- Empowering Learners
- Facilitating Learners' Digital Competences

DQ:

- Digital rights
- Digital literacy
- Digital Communication
- Digital Emotional Intelligence
- Digital Security
- Digital safety
- Digital Use

- Digital identity

21st P Information Media and Technology skills:

- Learning and Innovation skills
- Information Media and Technology skills (Information literacy, Media literacy, ICT literacy)
- Life and Career skills

Competence Frameworks					
DigiComp2.1	**UNESCO: Digital Literacy Global Framework Competences**	**Microsoft's 21st century learning skills**	**DigiCompEdu**	**DQ Competence Framework**	**21st P Information Media and Technology skills**
Competence Areas					
Information and Data Literacy	Devices and software operations	Collaboration	Professional Engagement	Digital rights	Learning and Innovation skills
Communication and Collaboration	Information and data literacy	Real World Problem Solving and Innovation	Digital Resources	Digital literacy	Information Media and Technology skills
Digital Content Creation	Communication and Collaboration	Skilled Communication	Teaching and Learning	Digital Communication	Life and Career skills
Safety	Digital Content Creation	Knowledge Construction	Assessment	Digital Emotional Intelligence	
Problem solving	Safety	Self-Regulation	Empowering Learners	Digital Security	
	Problem-solving	Use of ICT for learning	Facilitating Learners' Digital Competences	Digital safety	
	Career-related competences			Digital Use	
				Digital identity	

Table 8a

The common competence areas or those with close and common context can be grouped and sorted from the most common to the least, as presented in the following table:

Competence Frameworks					
DigiComp2.1	**UNESCO: Digital Literacy Global Framework Competences**	**Microsoft's 21st century learning skills**	**DigiCompEdu**	**DQ Competence Framework**	**21st P Information Media and Technology skills**
Competence Areas					
Communication and Collaboration	Communication and Collaboration	Skilled Communication	Digital Communication	Digital Communication	-
Information and Data Literacy	Information and data literacy	Use of ICT for learning	-	-	Information Media and Technology skills
-	Devices and software operations		Digital Resources	Digital Use	Information Media and Technology skills
Safety	Safety	-	-	Digital safety	-
				Digital Security	
Communication and Collaboration	Communication and Collaboration	Collaboration			
Problem solving	Problem-solving	Real World Problem Solving and Innovation	-	-	-
-	-	-	Facilitating Learners' Digital Competences	Digital literacy	Information Media and Technology skills
	Career-related competences				Life and Career skills
Digital Content Creation	Digital Content Creation	-	-	-	-
		Real World Problem Solving and Innovation			Learning and Innovation skills

Table 8b

The competence areas that were found only in one of the competence frameworks that were analysed have not been included in table 8b and are the following:

- Knowledge Construction
- Self-Regulation
- Assessment
- Empowering Learners
- Digital Emotional Intelligence
- Digital Identity
- Digital Rights
- Professional Engagement
- Teaching and Learning

The most common competence areas in descending order, from the most common to the least, are the following:

- *Communication (5)*: Communication and Collaboration (x2), Digital Communication (x2), Skilled Communication
- *Information (4)*: Information and Data Literacy (x2), Use of ICT for Learning, Information Media and Technology skills
- *Digital Use (4)*: Devices and Software Operations, Digital Resources, Digital Use, Information Media and Technology skills
- *Safety (4)*: Safety (x2), Digital Safety, Digital Security
- *Collaboration (3)*: Communication and Collaboration (x2), Collaboration
- *Problem Solving (3)*: Problem Solving, Problem Solving, Real World Problem Solving and Innovation
- *Digital Literacy (3)*: Facilitating Learners Digital Competences, Digital Literacy, Information Media and Technology skills
- *Career (2)*: Career Related Competence, Life and Career skills
- *Digital Content (2)*: Digital Content Creation (x2)
- *Innovation (2)*: Real World Problem Solving, Learning and Innovation skills

The table below presents the occurrence rate of the competence areas:

Competence Areas*	Occurrence Rate
Communication	5
Information	4
Digital Use	4
Safety	4
Collaboration	3
Problem-Solving	3
Digital Literacy	3
Career	2
Digital Content	2
Innovation	2
Knowledge Construction	1
Self-Regulation	1
Assessment	1
Empowering Learners	1
Digital Emotional Intelligence	1
Digital Identity	1
Digital Rights	1
Professional Engagement	1
Teaching and Learning	1

* The names of several common competence areas have been generalised to appropriately address all the competence areas that relate and are presented in Tables 8a and 8b

Table 9

Overview of Identified Competences

In the following tables, each competence area identified in the previous subchapter, is linked with the competences as described in the related competence area.

	DigiComp2.1	UNESCO: Digital Literacy Global Framework Competences	Microsoft's 21st century learning skills	DigiCompEdu	DQ Competence Framework	21st P Information Media and Technology skills
Communication	•Interacting through digital technologies •Sharing through digital technologies •Engaging in citizenship through digital technologies •Collaborating through digital technologies •Netiquette	•Interacting through digital technologies •Sharing through digital technologies •Engaging in citizenship through digital technologies •Collaborating through digital technologies •Netiquette	•Extended Communication •Multi-modal Communication •Supporting Evidence •Design for a particular audience	•Communication •Managing, Protecting, Sharing •Ogranisational Communication	•Digital Footprint Management •Online Communication and Collaboration •Public and Mass Communication	•Communication
Information	•Browsing, searching, filtering data, information and digital content •Evaluating data, information and digital content •Managing data, information and digital content	•Browsing, searching, filtering data, information and digital content •Evaluating data, information and digital content •Managing data, information and digital content	•Use of ICT •Use of ICT for knowledge construction •Design of ICT products	•Information and Media Literacy		•Access and Evaluate Information •Use and Manage Information
Digital Use		•Physical operations of digital devices •Software operations in digital devices	•Use of ICT	•Selecting •Creating and Modifying •Managing, Protecting, Sharing	•Balanced Use of Technology •Healthy Use of Technology •Civic Use of Technology	•Apply Technology Effectively
Safety	•Protecting devices •Protecting personal data and privacy •Protecting health and well-being •Protecting the environment	•Protecting devices •Protecting personal data and privacy •Protecting health and well-being •Protecting the environment			•Behavioral Cyber-Risk Management •Content Cyber-Risk Management •Commercial and Community Cyber-Risk Management •Personal Cyber Security Management •Network Security Management •Organizational Cyber Security Management	
Collaboration	•Interacting through digital technologies	•Interacting through digital technologies	•Working Together			•Collaboration

	•Sharing through digital technologies •Engaging in citizenship through digital technologies •Collaborating through digital technologies •Netiquette	•Sharing through digital technologies •Engaging in citizenship through digital technologies •Collaborating through digital technologies •Netiquette	•Shared responsibility •Substantive decisions •Interdependent work			
Problem-Solving	•Solving technical problems •Identifying needs and technological responses •Creatively using digital technologies •Identifying digital competence gaps	•Solving technical problems •Identifying needs and technological responses •Creatively using digital technologies •Identifying digital competence gaps	•Problem Solving •Real-World Problem •Innovation			•Critical thinking and problem solving
Digital Literacy				•Information and Media Literacy •Communication •Content Creation •Responsible Use	•Media and Information Literacy •Content Creation and Computational Literacy •Data and AI Literacy	•Analyze Media •Create Media Products
Career		•Operating specialised digital technologies for a particular field •Interpreting and manipulating data, information and digital content for a particular field				•Flexibility and adaptability •Initiative and self-direction •Social & cross-cultural interaction •Productivity and accountability •Leadership and responsibility
Digital Content	•Developing digital content •Integrating and re-elaborating digital content •Copyright and licenses •Programming	•Developing digital content •Integrating and re-elaborating digital content •Copyright and licenses •Programming				
Innovation			•Innovation			•Critical thinking and problem solving •Creativity and innovation •Communication •Collaboration
Knowledge Construction			•Knowledge Construction •Application of Knowledge			
Self-Regulation			•Planning own work •Revise Work Based on Feedback	•Self-regulated Learning		

Assessment				•Assessment Strategies •Analysing evidence •Feedback and Planning		
Empowering Learners				•Accessibility and Inclusion •Differentiation and Personalisation •Actively Engaging Learners		
Digital Emotional Intelligence					•Digital Empathy •Self-Awareness and Management •Relationship Management	
Digital Identity					•Digital Citizen Identity •Digital Co-Creator •Digital Changemaker Identity	
Digital Rights					•Privacy Management •Intellectual Property Rights Management •Participatory Rights Management	
Professional Engagement				•Ogranisational Communication •Professional Collaboration •Reflective Practice •Digital CPD		
Teaching and Learning				•Teaching •Guidance •Collaborative Learning •Self-regulated Learning		

Highlighted in red are those competences that even though they were identified and associated with one competence area, are also within other identified competence areas matching its description and the competences identified in other competence frameworks to belong in this alternate competence area.

Table 10

Suggested Framework Competence Areas and Competences

Below are the competence areas and competences relating to each area based on the analysis conducted in the previous chapters.

Communication

COMMUNICATION	
• Interacting through digital technologies • Sharing through digital technologies • Engaging in citizenship through digital technologies • Collaborating through digital technologies • Netiquette • Digital Footprint Management	• Online Communication and Collaboration • Public and Mass Communication • Extended Communication • Multi-modal Communication • Supporting Evidence • Design for a particular audience

Information

Information	
• Browsing, searching, filtering data, information and digital content • Evaluating data, information and digital content • Managing data, information and digital content	• Access and Evaluate Information • Use and Manage Information • Use of ICT • Use of ICT for knowledge construction • Design of ICT products

Digital Use

Digital Use	
• Physical operations of digital devices • Software operations in digital devices • Selecting • Creating and Modifying • Managing, Protecting, Sharing	• Balanced Use of Technology • Healthy Use of Technology • Civic Use of Technology • Apply Technology Effectively

Safety

Safety	
• Protecting devices • Protecting personal data and privacy • Protecting health and well-being • Protecting the environment • Behavioral Cyber-Risk Management • Content Cyber-Risk Management	• Commercial and Community Cyber-Risk Management • Personal Cyber Security Management • Network Security Management • Organizational Cyber Security Management

Collaboration

Collaboration	
• Interacting through digital technologies	• Working Together

• Sharing through digital technologies • Engaging in citizenship through digital technologies • Collaborating through digital technologies • Netiquette	• Shared responsibility • Substantive decisions • Interdependent work

Problem Solving

Problem Solving	
• Solving technical problems • Identifying needs and technological responses • Creatively using digital technologies	• Identifying digital competence gaps • Problem Solving • Real-World Problem • Innovation

Digital Literacy

Digital Literacy	
• Information and Media Literacy • Communication • Content Creation • Responsible Use • Media and Information Literacy	• Content Creation and Computational Literacy • Data and AI Literacy • Analyze Media • Create Media Products

Career

Career	
• Operating specialised digital technologies for a particular field • Interpreting and manipulating data, information and digital content for a particular field	• Flexibility and adaptability • Initiative and self-direction • Social & cross-cultural interaction • Productivity and accountability • Leadership and responsibility

Digital Content

Digital Content	
• Developing digital content • Integrating and re-elaborating digital content	• Copyright and licenses • Programming

Innovation

Innovation	
• Critical thinking and problem solving • Creativity and innovation	• Communication • Collaboration

Knowledge Contsruction

Knowledge Construction	
• Knowledge Construction	• Application of Knowledge

Self-Regulated Learning

Self-Regulated Learning	
• Planning own work	• Revise Work Based on Feedback

Assessment

Assessment	
• Assessment Strategies • Analysing evidence	• Feedback and Planning

Empowering Learners

Empowering Learners	
• Accessibility and Inclusion • Differentiation and Personalisation	• Actively Engaging Learners

Digital Emotional Intelligence

Digital Emotional Intellegence	
• Digital Empathy • Self-Awareness and Management	• Relationship Management

Digital Identity

Digital Identity	
• Digital Citizen Identity • Digital Co-Creator	• Digital Changemaker Identity

Digital Rights

Digital Rights	
• Privacy Management • Intellectual Property Rights Management	• Participatory Rights Management

Professional Engagement

Professional Engagement	
• Ogranisational Communication • Professional Collaboration	• Reflective Practice • Digital CPD

Teaching and Learning

Teaching and Learning	
• Teaching • Guidance	• Collaborative Learning • Self-regulated Learning

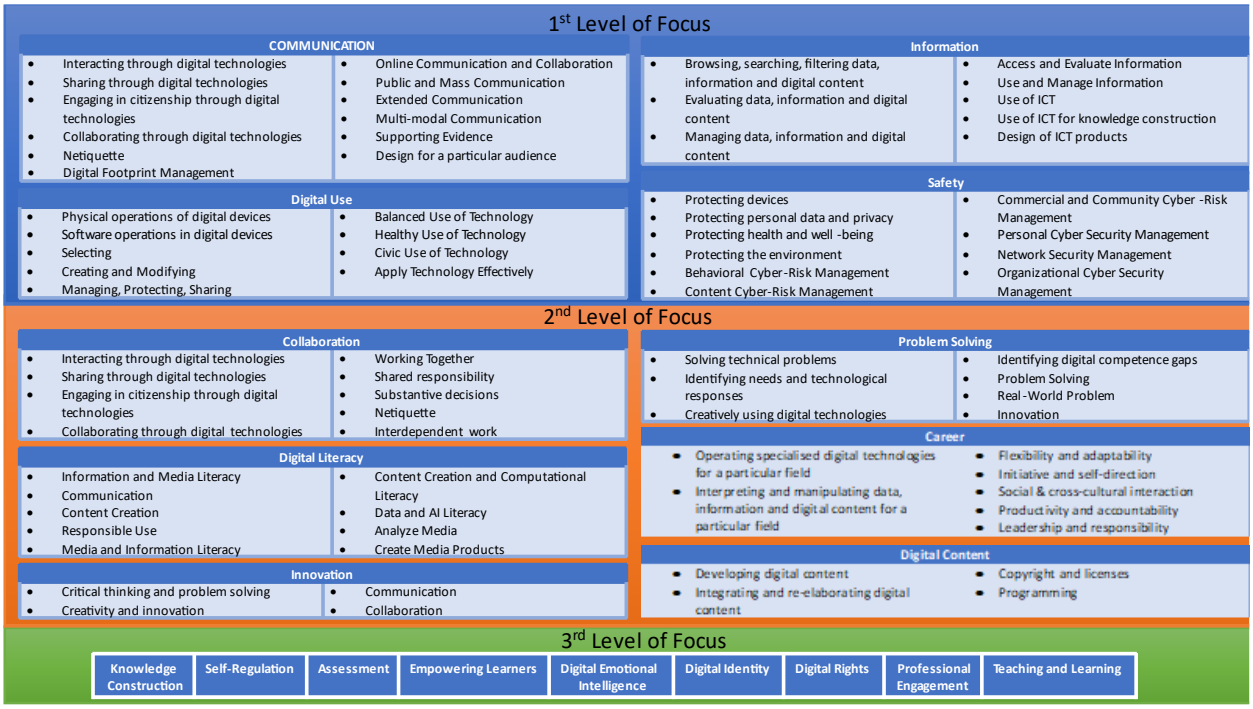
Suggested Framework Representations for Focus Group Validation

The following suggestions of visual representation of the findings from the analysis of the competence frameworks are categorised based on the following:

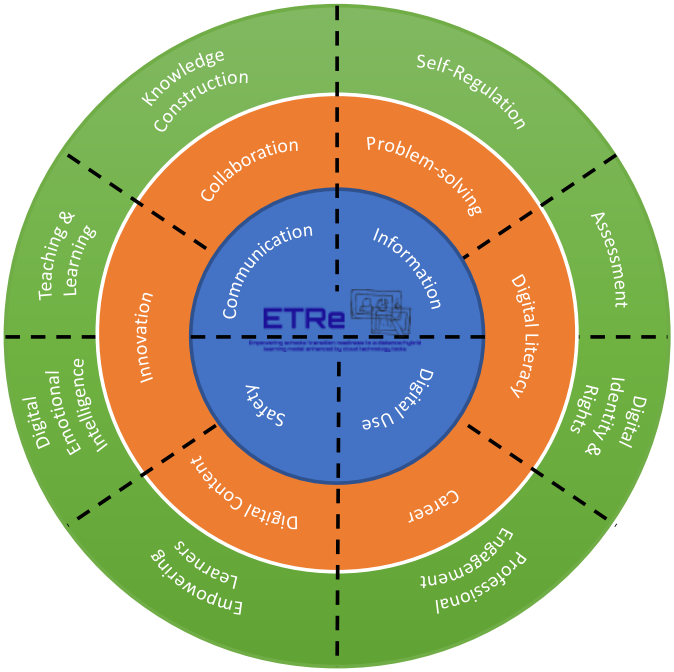
- Occurrence rate of each competence area in the competence frameworks
- Grouping of competence areas

Suggestions based on occurrence rate of competence areas

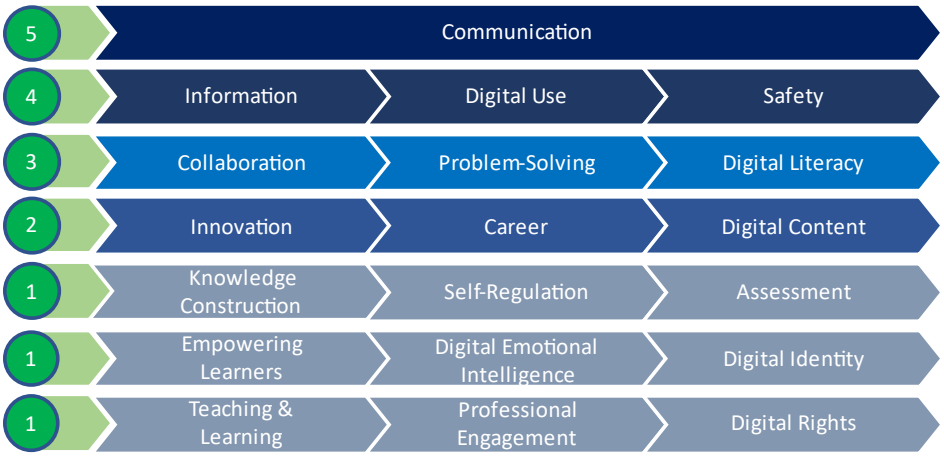
Suggestion 1



Suggestion 2



Suggestion 3



Suggestions based on competence areas grouping

Suggestion 4

Soft Skills	Digital Skills	Teaching Skills	Professional Skills
Communication	Digital Use	Assessment	Career
Information	Digital Content	Knowledge-Construction	Self-Regulation
Collaboration	Digital Literacy	Empowering Learners	Professional-Engagement
Innovation	Digital Emotional Intelligence	Teaching & Learning	
Problem-Solving	Digital Identity		
	Digital Rights		
	Digital Use		

Suggestion 5

Focus Group with Experts

Organisation

The focus groups were organized and held in partners' countries between November 2021 – December 2021. Partners invited experts in the field of education to share with them the results of the exploration of the competence frameworks and receive their targeted feedback in order for the project to finalise the suggested teacher framework.

The participants were presented with the following:

- Introduction and information to the project objectives, results, target groups, etc.
- The aim of the focus group
  (*The Focus Group is organized with the purpose to investigate and analyze the importance of competence areas as they appear in several competence frameworks, evaluate different ways of representations and try to identify what representation is the most effective*)
- Method of analysing the competence frameworks
- Results of the analysis

More specifically, they were presented with the following questions:

1. The following competences areas are the ones that have the highest occurrence rates in all the frameworks. How important do you find these competence areas?

- Communication
- Information
- Digital Use
- Safety
- Collaboration
- Problem-Solving
- Digital Literacy
- Career
- Digital Content
- Innovation

2. The following competence areas are the ones that have the lowest occurrence rates in all frameworks. Do you find these specific competences important and relevant?

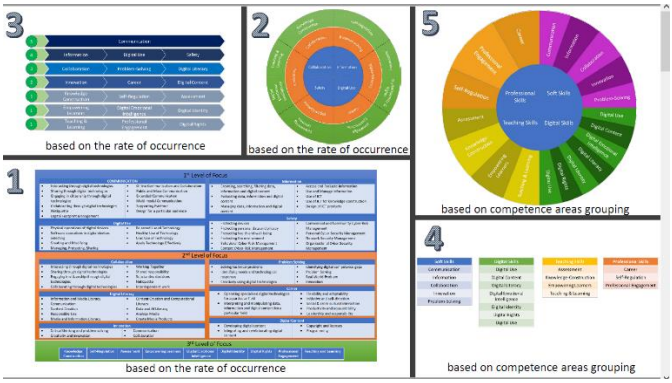
- Knowledge Construction
- Self-Regulation
- Assessment
- Empowering Learners
- Digital Emotional Intelligence
- Digital Identity
- Digital Rights
- Professional Engagement
- Teaching and Learning

3. Do you feel that some of the competences overlap and they could be better expressed as one?

4. What is your opinion on grouping the competences according to their occurrence rate? Can you think of a more suitable grouping?

5. Which of the provided representations do you feel that better present the competences developed by the educational frameworks analyzed?

6.Which of the following representations do you feel that would be easier comprehensible?



Implementation of FGs with experts

Due to COVID-19 outbreak and the measures taken by the authorities of different partner countries', some of the partners were able to organise the FG within physical presence whether others conducted the FG on-line.

In each focus group was implemented with a team of 4-5 experts in order to facilitate a discussion that would involve all participants while at the moment enable the facilitator to better record their aspect on the issues discussed.

Results of the Focus Groups with Experts

1. The following competences areas are the ones that have the highest occurrence rates in all the frameworks. How important do you find these competence areas?

Communication, Information, Digital Use, Safety, Collaboration, Problem-Solving, Digital Literacy, Career, Digital Content, Innovation

In most countries and especially in Italy and Cyprus, participants gave the highest importance to digital literacy. In fact, in the discussion, all the participants agreed that digital literacy is the basic knowledge about the digital environment that everyone should have. This competence refers to a basic understanding of digital tools that each citizen should have in the actual society.

Although many educators still lack digital competence and do not have IT skills proficiency, however, they realise that digital literacy is essential nowadays, in all aspects of life. During our education and training, when socialising, when working, in our professional development. For example, in our personal life, we need digital skills to use gadgets like smart phones, tablets and laptops, or to access various public authorities which provide their services in digital form. Another competence that participants selected as important is the "Digital Use" as well as the "choice and use of the appropriate ICT Tools". The participants consider important to be able use the appropriate tools for their professional needs because this will make their work more productive and efficient.

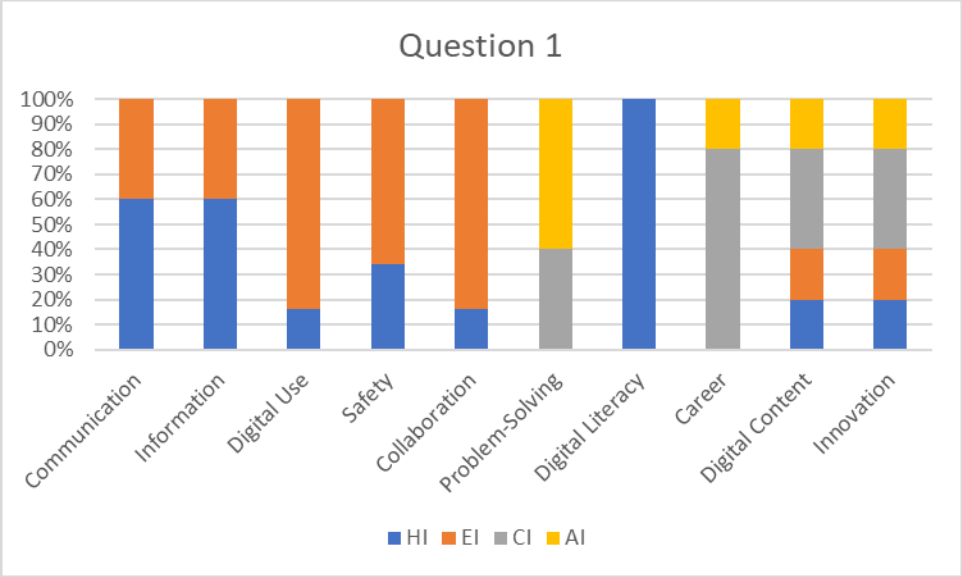
In general, participants consider high relevant what they believe as 'basic' skills such as information and communication. They consider less important the skills that they define as more "technical" such as problem-solving or digital content, which already needs basic skills to be understood.

The participants consider that some of the competences shown in the list might not be so important for the school environment, even though they are the most frequent in the competence frameworks analysed.

In addition to the above, some other participants expressed the opinion that even though digital literacy is important, more important is the willingness of an educator to learn and upgrade professional and personal skills as well as be able to communicate with their colleagues, to ask for support or find solutions to problems together. (competences indicated “Communication”, “Collaboration”, “Problem –Solving”).

The participants were presented with the question and were asked to comment and complete a Likert scale-type question mentioning the important of each competence. The combined results are presented in the table below (the choices were: Extreme Importance – EI, High Importance – HI, Considerable Importance – CI, Average Importance – AI)

Communication	**60%** HI, **40%** EI, **0%** CI, **0%** AI
Information	**60%** HI, **40%** EI, **0%** CI, **0%** AI
Digital Use	**16%** HI, **84%** EI, **0%** CI, **0%** AI
Safety	**34%** HI, **66%** EI, **0%** CI, **0%** AI
Collaboration	**16%** HI, **84%** EI, **0%** CI, **0%** AI
Problem-Solving	**0%** HI, **0%** EI, **40%** CI, **60%** AI
Digital Literacy	**100%** HI, **0%** EI, **0%** CI, **0%** AI
Career	**0%** HI, **0%** EI, **80%** CI, **20%** AI
Digital Content	**20%** HI, **20%** EI, **40%** CI, **20%** AI
Innovation	**20%** HI, **20%** EI, **40%** CI, **20%** AI



2. The following competence areas are the ones that have the lowest occurrence rates in all frameworks. Do you find these specific competences important and relevant?

Knowledge Construction, Self-Regulation, Assessment, Empowering Learners, Digital Emotional Intelligence, Digital Identity, Digital Rights, Professional Engagement, Teaching and Learning

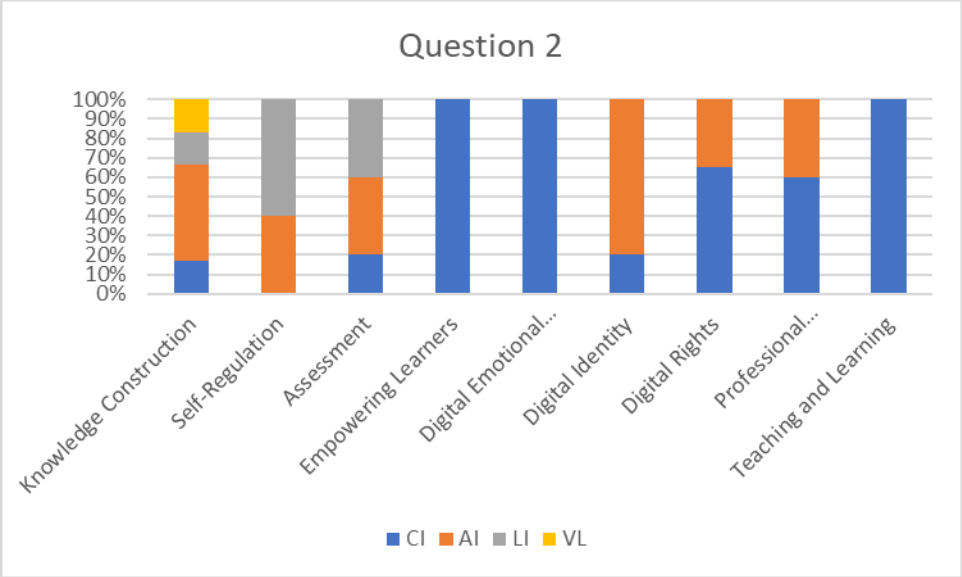
There were two main groups of competences that different participants from different focus groups indicated. The first team of competences that was characterized as most relevant were: Empowering Learners, Digital Emotional Intelligence and Teaching and Learning. The other team of competences based on the feedback were: Professional Engagement, Knowledge Construction and Digital Emotional Intelligence and Digital Rights.

In one hand, they consider Digital Emotional Intelligence a key competence in the classroom. Participants explained that many students in the classrooms are different in terms of socio-economic conditions, ethnicity, gender, etc. Being different in the school environment often leads to bullying or exclusion phenomenon and this is also reflected in the digital environment (cyberbullying etc.). Therefore, the opinion of the participants is that teaching this skill should prepare students to respect others and it should be useful to prevent these behaviours.

On the other hand, “Professional Engagement” is important, because it is considered the driving force to become professionally better and develop and upgrade your skills, “Knowledge Construction” and “Digital Emotional Intelligence” are very important both for the educators and students. These are essential elements for the creation of a constructive and cooperative professional environment. Finally, “Digital Rights” are important and essential, especially to protect minors.

The participants were presented with the question and were asked to comment and complete a Likert scale-type question mentioning the relevance and important of each competence. The combined results are presented in the table below (the choices were: Considerable Importance – CI, Average Importance – AI, Low Importance – LI, Very Low Importance – VL).

Knowledge Construction	**20%** CI, **60%** AI, **20%** LI, **0%** VL
Self-Regulation	**0%** CI, **40%** AI, **60%** LI, **0%** VL
Assessment	**20%** CI, **40%** AI, **40%** LI, **0%** VL
Empowering Learners	**100%** CI, **0%** AI, **0%** LI, **0%** VL
Digital Emotional Intelligence	**100%** CI, **0%** AI, **0%** LI, **0%** VL
Digital Identity	**20%** CI, **80%** AI, **0%** LI, **0%** VL
Digital Rights	**65%** CI, **35%** AI, **0%** LI, **0%** VL
Professional Engagement	**60%** CI, **40%** AI, **0%** LI, **0%** VL
Teaching and Learning	**100%** CI, **0%** AI, **0%** LI, **0%** VL



3. Do you feel that some of the competences overlap and they could be better expressed as one?

In most focus groups, participants consider that the competences as expressed are fine. Although some of them are similar, it is risky to group them together because some specific characteristics of competences might be lost.

Some other opinions that were expressed and are worth noting are the following:

The three competences “Digital Use”, “Digital Literacy” and “Digital Content” should be expressed as one because they are interconnected and related competences.

Also, “Safety” and “Digital Rights” could be combined together as “safety” could be considered one of the “Rights”.

In addition, “Communication” with “Innovation” in the sense that communication could lead and help to develop innovation and progress.

Furthermore, another answer was about “Communication” to be combined with “Collaboration” to strengthen the possibility of solving problems.

4. What is your opinion on grouping the competences according to their occurrence rate? Can you think of a more suitable grouping?

The main opinions expressed were:

- It depends on what you want to achieve or present. For example, the frequency in which the competences appear in the different frameworks can be the main category or be shown more distinctively but there could be other subcategories with other competences which can be related to the main category (maybe in smaller letters)

- Some competences relevant in school are not well considered. We discussed together and we have thought that not all the competences frameworks are created for a school environment. Thus consider includes in the list some competences that are relevant in school

- Grouping the competences based on their level of difficulty. For example, basic level (skills that everyone has to know); medium level (skills intermediate) and high level (advanced skills)

5. Which of the provided representations do you feel that better present the competences developed by the educational frameworks analyzed?

Again, slightly different results arise from the different focus groups. Although in most focus groups, following a whole group discussion, figure 5 was the most attractive and efficient for schoolteachers.

Some of the focus groups expressed the opinion that graph 1 is also a good representation as it is very detailed while in other focus groups graph 1 was not one of the first preferences as it had to much information and thus needs more time to comprehend it.

As for the visual aspect of the representation, the focus group participants from Cyprus, mentioned that Graph 3 is a good representation but would prefer colours that are warmer and brighter.

6.Which of the following representations do you feel that would be easier comprehensible?

Most FG participants agreed that figure 2 and figure 5 are the most understandable.

In fact, although they consider figure 1 to be more complete, they prefer figures 2 and 5 because they are colourful and schematic. Having little content and being divided by colour, these two representations are easily understood by most people.

In some focus group the suggestion for brighter and warmer colours came up again.

In one focus group one participant suggested that said to be careful about using colour in this kind of tool because some people, such as colour-blind people, might have problems.

Conclusion of the Focus Group Results

Overall participants expressed positive opinions towards the analyzation of the competence frameworks. More specifically they argued in favor and agreed that the best way to study the competence areas of the different competences was to link the same or very similar areas and examine how often each competence area appears though out the frameworks.

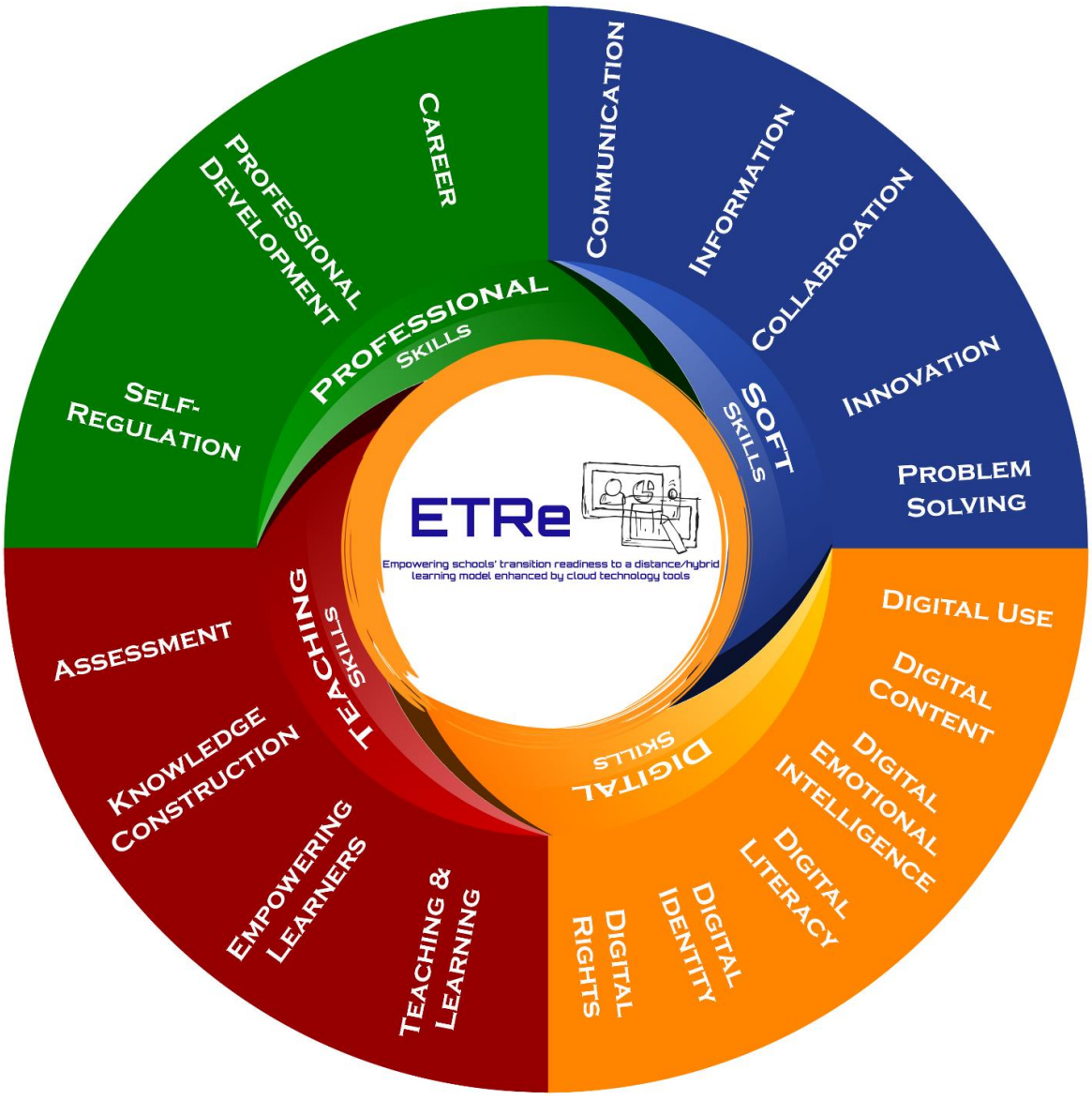
The ETRe project partners, having recognized the fact that not all competence frameworks target teachers/educators, they asked partners to pinpoint the most important competence areas for teachers among those with a high rate of occurrence and the most irrelevant among those with a low rate of occurrence.

Even though several participants expressed the opinion that they prefer to be presented with all three levels of the analyzation (competence areas, competences, skills) most argued that since the main target group are teachers, it might be more effective to have a simple and clear two-level representation (competence areas, competences).

Furthermore, representation wise, despite the fact that the majority agreed that the competence area occurrence rate is important at the phase of exploring the differences and similarities between frameworks, most of them were in favor of grouping the competence areas based on their context.

ETRe Project Competence Framework Representation

Based on the joint analyzation of the Focus Groups' results partners redesigned the representation of the ETRe Competence Framework for Teachers.



Resources

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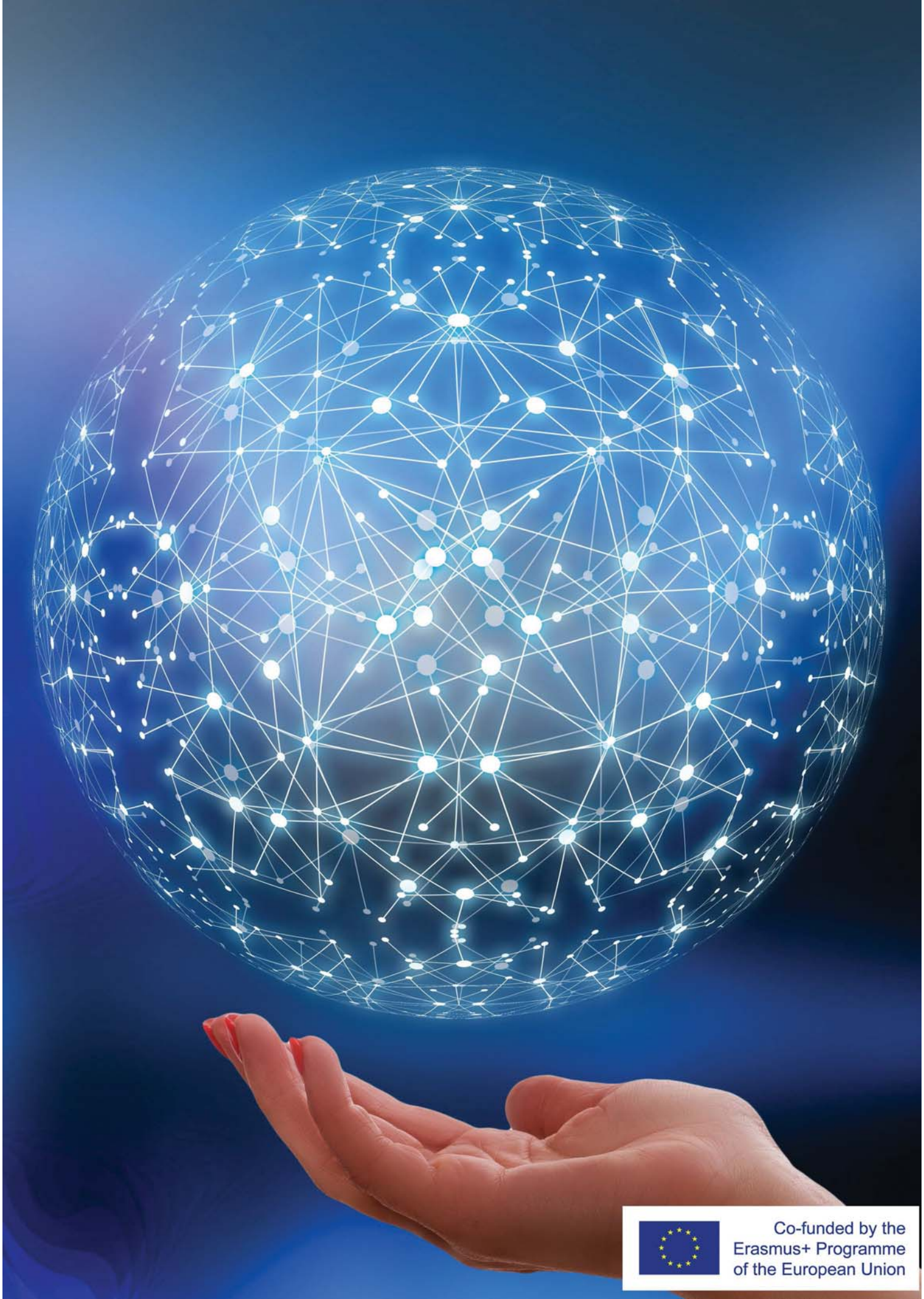

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