

DIGITAL COMPETENCY FRAMEWORK

APRIL 2019



MESSAGE FROM THE MINISTER

The Digital Action Plan for Education and Higher Education is an ambitious project for the Québec education system. One of its three objectives is to support the development of Quebecers' digital skills. But what do we mean by *digital skills*, and how can they be properly integrated into the types of education and training currently offered?

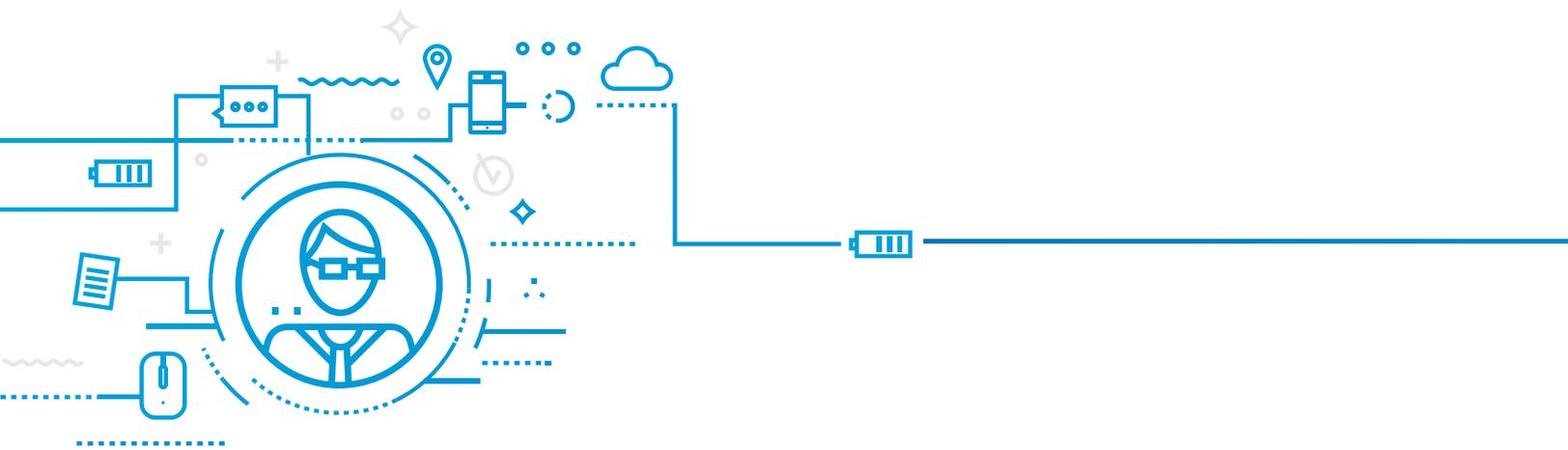
The answers to these questions will be found in the *Digital Competency Framework*. This framework will foster a better understanding of digital competency while helping ensure all Québec students and teachers develop the skills they need. It will be an invaluable reference tool for education and higher education stakeholders in adapting their pedagogical planning and educational projects to today's digital world.

I am pleased to present this publication, which sets out the key dimensions of learning and personal development in the 21st century. The digital sphere, while highly interesting, is vast and at times highly complex. I sincerely believe this framework will prove helpful to teachers and, therefore, to all the students in our education system.

It is our children and young people who will ultimately benefit from the *Digital Competency Framework*. They are already navigating the digital world, and, with quality teaching and support to help them on their way, they will become active, connected and responsible citizens who will go on to play key roles in the world of tomorrow.

I would like to thank all those who have contributed to this publication, which I'm sure will prove a valuable tool to many.

Jean-François Roberge
Minister of Education and Higher Education



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INTRODUCTION

This document is part of the Digital Action Plan (DAP) for Education and Higher Education, which was unveiled on May 30, 2018, and will be completed in 2023. The plan promotes the vision of the effective integration and optimal use of digital technologies to foster the success of all Quebecers in order to promote lifelong skills development and maintenance. The DAP's first measure is structural and involves the establishment and implementation of a reference framework.

The objective of this project was to design an inter-level digital competency framework spanning preschool through higher education, including general education and vocational training. The *Digital Competency Framework* sets out the key dimensions of learning and personal development in the 21st century—for learners as well as for teachers and non-teaching professionals. Elements specific to teaching will be addressed in more detail in the upcoming competency framework for the teaching profession.

GENERAL OBJECTIVES OF THE FRAMEWORK

The aim of this framework is to develop digital competency, which is defined as a set of skills necessary to the confident, critical and creative use of digital technologies to achieve objectives with regard to learning, work, leisure, and inclusion or participation in society. The framework's dimensions and their respective elements have been designed to permit individuals to become increasingly autonomous in their use of digital technologies in educational or professional contexts as well as in everyday life, so that they are able, for example, to select the best digital tools to perform a particular task.

Digital competency should also ensure that individuals are able to adapt to technological innovations in years to come, including advances in artificial intelligence—to assess these new technologies critically and to adopt and implement any they may deem to be useful.

Finally, digital competency is closely tied to professional development for all 21st-century workers: everyone needs to be able to use available digital resources—such as communities of practice and online training or tutorials—in order to keep their professional skills up to date.

In short, the aim of this framework is to foster the development of digital competency throughout the educational community so that Quebecers may be autonomous and exercise critical judgment in their use of digital technologies. Digital competency is essential in today's world, in which technological innovations are transforming the labour market and the skills employers are looking for. It is therefore vital that teaching practices and programs be adapted and include digital competency in order to prepare future workers for the challenges of tomorrow.

FRAMEWORK PRINCIPLES

The *Digital Competency Framework* takes into account the latest research and innovative practices in education. Without denying the risks inherent in the so-called digital divide, the framework demonstrates how digital technology can serve as a tool for inclusion. Digital universal design in education should allow for the use of digital technology by all people, without the need for adaptation or special design, and regardless of gender, age, situation, or disability.

The framework also adopts a competency-based approach. The term *competency* should be understood here to refer to “complex know-how developed through the effective mobilization of a range of internal and external resources in a variety of related situations.”¹ Thus, we will be exploring competency characteristics as constituent elements of complex know-how.²

It would be unrealistic however to attempt to foresee all possible applications given the daily occurrence of technological developments. All individual competencies draw on numerous and varied resources,³ especially as competencies may evolve over time. Given that we cannot predict the future, digital competency must be conceived of in a sufficiently flexible and adaptive way so as not to be invalidated by technological innovations or new digital resources. **Consequently, the framework must be able to accommodate technological innovation.**

Competencies can therefore be combined. The framework does not exist in a vacuum; rather, **it allows for a wide range of combinations of resources, be they tools, dimensions or skills.**

Furthermore, as competencies are developed over a lifetime (especially with regard to digital technology), a hierarchical or linear framework would be inconceivable. Each competency may evolve, be reinforced or updated, which implies a cyclical nature. Continuous competency development goes hand in hand with the enrichment of one’s store of personal resources as one gains experience. **Implementation of this framework is therefore an iterative process.**

Competencies and competency development are also fundamentally contextual. **Examples drawn from a variety of contexts are provided to illustrate the dimensions of this framework.**

¹ J. Tardif, *L'évaluation des compétences: Documenter le parcours de développement* (Montréal: Chenelière Éducation, 2006). [Translation]

² Ibid.

³ Ibid.

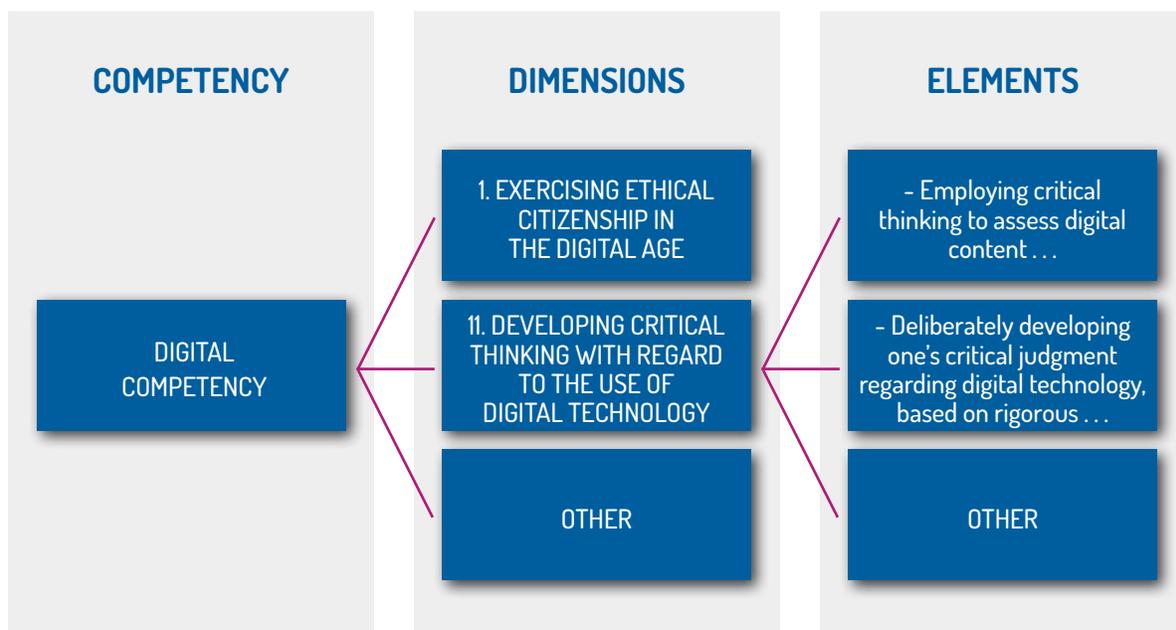
ONE COMPETENCY, 12 DIMENSIONS

The digital competency framework presented here has been shaped by the systematic analysis of more than seventy 21st-century information literacy and digital competency frameworks from all over the world. While it draws on a wealth of existing work, the framework is also based on a study of emerging digital trends in education. Compared to documents published in other countries, this project is innovative in its holistic understanding of digital competency. Furthermore, the decision to formulate a single digital competency facilitates its integration into other frameworks or documents related to teaching and learning (such as the new competency framework for the teaching profession).

The proposed competency is divided into 12 key dimensions. *Exercising ethical citizenship in the digital age* and *Developing and mobilizing technological skills* are the central dimensions around which the other dimensions are articulated.

OVERVIEW

As mentioned above, the framework breaks down digital competency into 12 dimensions, each comprising several elements. In other words, there are three levels to digital competency:



The *Digital Competency Framework* adopts the following format:



DIMENSION

1 EXERCISING ETHICAL CITIZENSHIP⁴ IN THE DIGITAL AGE

ELEMENTS:

- Behaving ethically, taking into consideration the social, cultural and philosophical diversity of digital society as well as the social, economic, environmental and professional contexts in which interactions may take place
- Being aware of the impact of the use of digital technology on one's physical and psychological well-being
- Understanding the issues around the commodification of personal information, the influence of digital advertising, and the perceived reliability of websites
- Reflecting on the ethical implications of laws and regulations governing digital technology, including those pertaining to copyright

CONCRETE EXAMPLES:

IN A LEARNING CONTEXT

- **The learner** is careful to verify the source and content of an email before opening an attachment or clicking on a link in order to avoid phishing and to keep personal data safe.

IN A TEACHING CONTEXT

- **A teacher or non-teaching professional** who posts a piece of music online for learners first checks to ensure compliance with the legal conditions for sharing that particular work.

⁴ Here, *ethical citizenship* is understood to refer to the ability to take a step back when considering ethical issues.

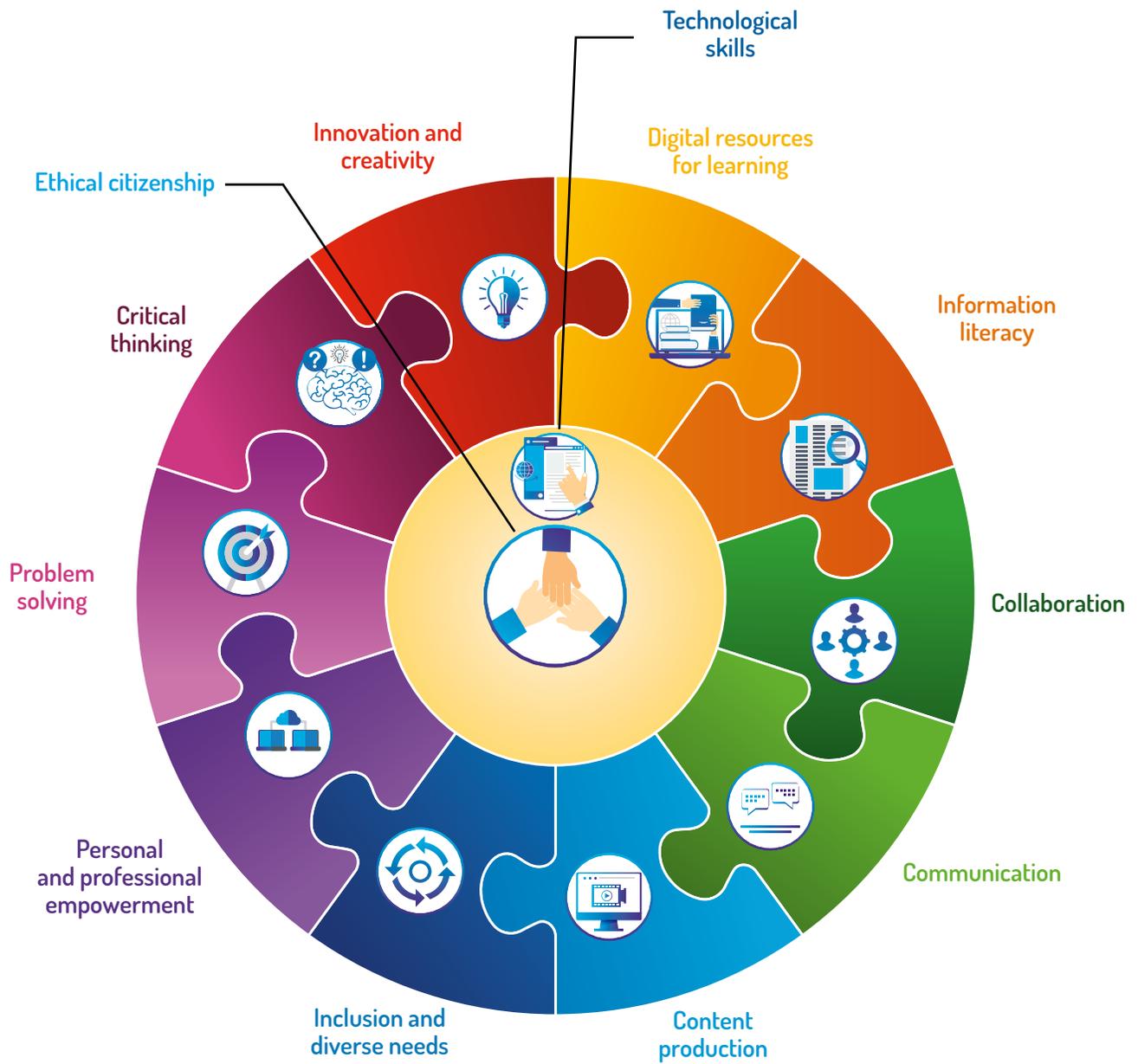
INFORMATION ON DIMENSIONS AND ELEMENTS

The dimensions of the framework are strongly interrelated: they may come into play simultaneously during a given task and may overlap. A dimension may be reinforced by one or more other dimensions. For instance, an educational activity may be designed to develop both communication skills and collaborative skills through the use of digital technology. The dimensions have therefore been numbered in no particular order. The first dimension (*Exercising ethical citizenship in the digital age*) is the cornerstone of the framework and is generally combined with other dimensions. For example, reflection on ethical considerations regarding copyright (an element of the first dimension) occurs in tandem with the use of information sought and obtained via digital means (an element of the fourth dimension). Similarly, the individual's understanding of digital identity issues (an element of the first dimension) is mobilized in the production and distribution of digital content (an element of the seventh dimension).

The dimensions and their respective elements are not associated with a particular subject, although it may initially appear this way. Each dimension applies to a multitude of subject-specific contexts; in order to fully develop digital competency, the different dimensions must be applied in a broad range of contexts.

Each element of the various dimensions begins with an action verb and provides a more concrete understanding of the skills associated with that dimension. All of the elements have to do with the use of digital technology, even where this is not explicitly stated. For example, "Mobilizing a variety of resources and solving a problem creatively," an element of the tenth dimension, means the individual uses digital resources and develops personal creativity by mobilizing digital technology.

VISUAL REPRESENTATION OF THE FRAMEWORK





1 EXERCISING ETHICAL CITIZENSHIP⁴ IN THE DIGITAL AGE

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2 DEVELOPING AND MOBILIZING TECHNOLOGICAL SKILLS

ELEMENTS:

- Developing a general understanding of artificial intelligence and its impact on education, society, culture and politics
- Developing greater awareness of emerging issues concerning digital technology and its impact on education
- Learning to use new technologies to keep one's digital skills up to date
- Developing computational thinking, particularly through the improvement of one's programming skills and enhancement of one's understanding of computer programming
- Securing personal data with the appropriate resources, taking into account the risks associated with the use of digital technology
- Mobilizing the technological skills required to use different software, digital platforms and applications in educational activities and everyday life
- Exploring how everyday devices function on a mechanical, electronic and computer level
- Implementing an appropriate solution or seeking help to solve a technological problem

CONCRETE EXAMPLES:

IN A LEARNING CONTEXT

- **The learner** learns to use digital tools to improve writing, utilizing collaborative online publishing.

IN A TEACHING CONTEXT

- **The teacher or non-teaching professional** introduces learners to programming using robots that move on an image map.



3 HARNESSING THE POTENTIAL OF DIGITAL RESOURCES FOR LEARNING

ELEMENTS:

- Using digital technology to develop or co-develop subject-specific, teaching and techno-pedagogical competencies
- Selecting and properly using digital tools and resources to help one learn, including to conduct self-assessment
- Using the opportunities digital technology provides to whet one's curiosity and expand one's horizons, as well as to learn or help others learn

CONCRETE EXAMPLES:

IN A LEARNING CONTEXT

- **The learner** strategically selects note-taking and organizational tools to retain information and learn more effectively.

IN A TEACHING CONTEXT

- **The teacher or non-teaching professional** proposes a learning situation involving the use of a video game to explore historical, literary or visual references related to the subject being taught.



4 DEVELOPING AND MOBILIZING INFORMATION LITERACY

ELEMENTS:

- Selecting and using information appropriately, mindful of information overload and filter bubbles
- Recognizing situations in which further information is required, and taking appropriate action by planning and implementing an effective and meticulous research strategy
- Mobilizing all available resources, including content experts and information specialists
- Assessing traditional and digital information, including information published by friends and family and on social media, using stringent criteria and good judgment to determine the credibility and reliability of sources and content
- Assessing and making any necessary adjustments to one's research results, and organizing the resulting content for analysis
- Adopting a reflective attitude toward information and its uses, cognizant of the context in which it has been produced and acquired as well as of the purposes for which it is being employed

CONCRETE EXAMPLES:

IN A LEARNING CONTEXT

- **The learner** is able to plan and implement a research strategy to find out more about a topic for an oral presentation.

IN A TEACHING CONTEXT

- **The teacher or non-teaching professional** is able to address current events in the classroom by having learners analyze source and media credibility and deconstruct any rumours that may arise.



5 COLLABORATING VIA DIGITAL TECHNOLOGY

ELEMENTS:

- Seizing opportunities for collaboration and even co-creation by taking full advantage of media or digital environments
- Selecting and using appropriate digital collaboration tools based on needs and context
- Developing interpersonal skills in order to interact respectfully and effectively with others, mindful of one's role in a group
- Offering to use one's skills to serve the community
- Using a variety of digital collaboration tools and performing different tasks to make it possible for the members of a group to co-create

CONCRETE EXAMPLES:

IN A LEARNING CONTEXT

- **The learner** in a virtual classroom actively participates in a collaborative project by exchanging ideas with classmates.

IN A TEACHING CONTEXT

- **The teacher or non-teaching professional** develops and leads an activity for learners to contribute to a collaborative online encyclopedia, guiding them through the process.



6 COMMUNICATING VIA DIGITAL TECHNOLOGY

ELEMENTS:

- Communicating appropriately with others, adapting messages to a given context and taking into account the rules and conventions governing digital communication
- Selecting and using appropriate digital communication tools based on one's needs
- Mobilizing a range of digital communication strategies and tools and using them in educational, professional and everyday activities
- Recognizing and defining guidelines essential to safeguarding the confidentiality of one's own communications and the communications of others

CONCRETE EXAMPLES:

IN A LEARNING CONTEXT

- **The learner** selects an appropriate discussion tool based on the nature of communication (private or public) in order to protect the privacy of personal data.

IN A TEACHING CONTEXT

- **The teacher or non-teaching professional** uses digital communication tools to communicate confidentially with a student's parents about the student's academic progress.



7 PRODUCING CONTENT VIA DIGITAL TECHNOLOGY

ELEMENTS:

- Producing or co-producing a variety of content (digital or otherwise) using digital technologies in the context of educational, professional or everyday activities
- Selecting and using appropriate digital production tools based on one's needs
- Using different media such as text, sound or images to exploit digital data
- Consulting and using content available in one's immediate environment or online to inspire or shape products, while behaving ethically toward other content producers and respecting their legal rights

CONCRETE EXAMPLES:

IN A LEARNING CONTEXT

- **The learner** creates a blog to present a project carried out in class.

IN A TEACHING CONTEXT

- **The teacher or non-teaching professional** produces a video that will be posted online to help learners do a project.



8 USING DIGITAL TOOLS TO FOSTER INCLUSION AND ADDRESS DIVERSE NEEDS

ELEMENTS:

- Mobilizing digital strategies and tools to address diverse needs and overcome barriers
- Selecting and using digital tools following an adapted analysis of one's needs
- Analyzing each tool's features in light of one's needs and of cultural, physical, technical or economic accessibility constraints in order to identify the tool's benefits and limitations

CONCRETE EXAMPLES:

IN A LEARNING CONTEXT

- **The learner** knows how to select, from a range of alternatives, the tool that most closely meets the requirements of a given learning situation, while taking into account peer needs and preferences.

IN A TEACHING CONTEXT

- **The teacher or non-teaching professional** provides support to a learner with a visual impairment by offering the learner software with appropriate accessibility features.



9 MOBILIZING DIGITAL TECHNOLOGY FOR PERSONAL AND PROFESSIONAL EMPOWERMENT⁵

ELEMENTS:

- Using digital technology to acquire, maintain and develop competencies for use in one's current or future professional life
- Developing entrepreneurial competencies and autonomy via digital technology
- Employing digital technology to help one integrate into the workforce, especially by promoting one's skills to future employers
- Consulting appropriate digital content and professional networks to keep up to date on new developments in current or future professional fields and meet one's continuing-education needs

CONCRETE EXAMPLES:

IN A LEARNING CONTEXT

- **The learner** discovers professional opportunities by using digital technology to stay informed and interact with others in the field.

IN A TEACHING CONTEXT

- **The teacher or non-teaching professional** in a college-level technical training program has students produce short videos on the prevention of work-related accidents, as part of the *Ensure occupational health and safety* competency.

⁵ This dimension must be developed at all educational levels. It is important to raise all learners' awareness of their future professions, beginning at the elementary school level.



10 SOLVING DIVERSE PROBLEMS VIA DIGITAL TECHNOLOGY

ELEMENTS:

- Analyzing a situation to obtain an accurate, thorough understanding of a problem, and developing and implementing a satisfactory solution
- Asking for or offering assistance to develop a collaborative solution, particularly in the context of digital communities
- Mobilizing a variety of resources and solving a problem creatively
- Evaluating and adjusting one's approach throughout the process

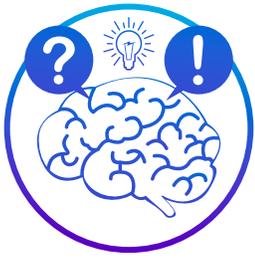
CONCRETE EXAMPLES:

IN A LEARNING CONTEXT

- **The learner** uses a discussion forum to ask a digital community about a problem encountered with a classroom project, and builds on the discussion to co-create an innovative proposal.

IN A TEACHING CONTEXT

- **The teacher or non-teaching professional** helps learners seek out solutions involving the use of digital technology to raise public awareness of climate change.



11 DEVELOPING CRITICAL THINKING WITH REGARD TO THE USE OF DIGITAL TECHNOLOGY

ELEMENTS:

- Employing critical thinking to assess digital content before using it
- Deliberately developing one's critical judgment regarding digital technology, based on rigorous analytical criteria through the use and comparison of digital resources
- Making a thoughtful and honest assessment of one's own use of digital technology
- Developing one's awareness of issues concerning the media, scientific advances, technological developments and the use of technology in order to be able to adopt a clear position, particularly with regard to the benefits and limitations of digital technology

CONCRETE EXAMPLES:

IN A LEARNING CONTEXT

- **The learner** assesses the reliability of a statement on a website using rigorous criteria and a variety of sources.

IN A TEACHING CONTEXT

- **The teacher or non-teaching professional** fosters discussion and encourages exchanges between learners on key contemporary issues such as artificial intelligence.



12 ADOPTING AN INNOVATIVE AND CREATIVE APPROACH TO THE USE OF DIGITAL TECHNOLOGY

ELEMENTS:

- Developing the ability to make innovative use of digital technology for creative projects in an artistic, personal or professional context
- Using or developing innovative⁶ approaches to improve or create objects, projects or processes
- Taking advantage of technological opportunities to develop and express one's creativity and nurture that of others
- Demonstrating receptivity to innovation by others

CONCRETE EXAMPLES:

IN A LEARNING CONTEXT

- **The learner** shares new web-inspired creations online.

IN A TEACHING CONTEXT

- **The teacher or non-teaching professional** uses virtual reality to simulate a historical milestone, helping learners develop historical empathy.

⁶ See definition of *innovation* in glossary.

METHOD

THIS SECTION OUTLINES
THE MAIN STEPS IN THE DEVELOPMENT
OF THIS FRAMEWORK.

PRE-CONCEPT PHASE

The development process for this framework began in May 2017 with a literature review and the elaboration of a matrix for recording the general characteristics of competency frameworks published around the world. The Ministère then mandated the Groupe de recherche interuniversitaire sur les impacts pédagogiques des technologies de l'information et de la communication (GRIIPTIC) to carry out the research. This first step led to the identification of 135 documents related to 21st-century competencies, information literacy skills and digital competencies carefully selected for their relevance from the many professional and academic frameworks, university frameworks, meta-frameworks, and scientific critiques of frameworks.

Preliminary analysis was based on matrix components. Each document was categorized by nature, origin, language, target audience, level of instruction and the type of hierarchical organization applied to competencies.

A textual analysis of the documents was conducted using IRaMuTeQ software to understand trends and any significant differences between them. The reports generated using this software made it possible to compare documents, particularly by publication year (before or after 2017) and language (French or English). The analysis of these results helped shape a first draft, and a level of concordance was identified among the various trends. Notably, it was observed that the frameworks foregrounded particular targets or skills depending on publication date and language.

In fall 2017, more than 70 information literacy and digital competency frameworks were analyzed using QDA Miner software, which made it possible to formulate a number of recommendations to ensure long-term applicability. To do this, a systematic content analysis was conducted based on the methodology suggested by Miles and Huberman (2003) and using emergent coding, with the competencies constituting the units of meaning.

The coding grid was first developed by three coders based on an analysis of six key frameworks and validated by all participating project researchers. Then, about 20 additional frameworks were coded, which led to the adjustment of the initial grid to take results and main trends into account. The preliminary results were then grouped according to four main themes: information literacy skills, 21st-century citizenship, use of digital tools, and digital learning. Finally, qualitative analysis continued with the application of QDA Miner software to about 50 additional frameworks, making it possible to consolidate the analysis grid and obtain data saturation.

DESIGN OF THE FIRST VERSION

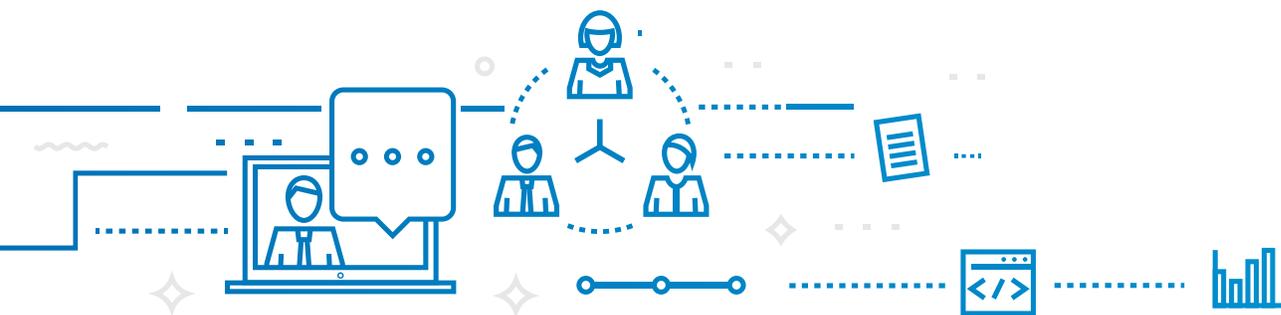
At the same time as the analysis described above, the researchers also wrote a report on the main trends observed in the use of digital technologies in educational contexts. This report, as well as a report developed through the analyses described above, led to the design of the first, early-2019, version of the framework, which included the framework's main dimensions and visual presentation. On the basis of the exhaustive study of frameworks carried out within this project, a dozen major components were highlighted, informed by descriptions in existing documents and by emerging trends.

CONSULTATION PROCESS

In March 2018, an initial consultation with GRIIPTIC members streamlined the content of the framework, which was then presented to the officials responsible for the project at the Ministère de l'Éducation et de l'Enseignement supérieur. The framework was then adapted to take into account the comments received.

In the spring of 2018, further consultation was carried out with education and higher education stakeholders: teachers, education consultants (particularly those belonging to the Réseau pour le développement des compétences par l'intégration des technologies [RÉCIT], the Network of ICT Respondents [ITREP Network] or the university community) and librarians at every level of education. These individuals were given the opportunity to comment on the framework by completing an online survey (SurveyMonkey).

All comments made by teachers and professionals were carefully analyzed and a report produced. This consultation process helped fine-tune the framework, thus enhancing its clarity and clarifying the purpose of each dimension.



GLOSSARY

A

ARTIFICIAL INTELLIGENCE (AI)

Field of study involving the artificial reproduction of the cognitive faculties of human intelligence with a view to producing software or machines capable of performing functions normally restricted to humans. AI has a variety of applications, ranging from automatic voice and visual recognition to robotic medicine and problem-solving tools.⁷

C

CO-CREATION

Act of collectively and creatively undertaking work or a project in such a way that it is impossible to distinguish each person's contribution in the end result.⁸

COMPETENCY

Complex know-how developed through the mobilization of a range of internal and external resources in a variety of related situations.⁹

COMMODIFICATION OF PERSONAL DATA

Commercial processes by which personal information gathering is used for marketing purposes. The theft of identity or banking information, and its possible subsequent resale, is an example of a situation in which personal information is illegally commodified.

CO-PRODUCTION

Act of collectively undertaking a project or creating a product in such a way that it is impossible to distinguish each person's contribution in the end product.

CREATIVITY

Ability or attitude that enables individuals to develop ideas, concepts or products they consider to be innovative.¹⁰

⁷ Québec, Ministère de l'Éducation et de l'Enseignement supérieur, *Digital Action Plan for Education and Higher Education* (2019), http://www.education.gouv.qc.ca/fileadmin/site_web/documents/ministere/PAN_Plan_action_VA.pdf.

⁸ Based on Ontario Ministry of Education, *21st Century Competencies: Foundation Document for Discussion, Phase 1: Towards Defining 21st Century Competencies for Ontario* (2016), 56, http://www.edugains.ca/resources21CL/About21stCentury/21CL_21stCenturyCompetencies.pdf; and R. Legendre, *Dictionnaire actuel de l'éducation*, 3rd ed. (Montréal: Guérin, 2005), 313.

⁹ J. Tardif, "Développer un programme par compétences: de l'intention à la mise en œuvre," *Pédagogie collégiale* 16, no. 3 (2003): 36–44.

¹⁰ Based on Ontario Ministry of Education, *21st Century Competencies: Foundation Document for Discussion, Phase 1: Towards Defining 21st Century Competencies for Ontario* (2016), 14, http://www.edugains.ca/resources21CL/About21stCentury/21CL_21stCenturyCompetencies.pdf; and R. Legendre, *Dictionnaire actuel de l'éducation*, 3rd ed. (Montréal: Guérin, 2005), 312.

CRITICAL THINKING

Practice of rational evaluation based on reflection, self-criticism and self-correction. Requires a series of skills and a willingness to engage in reasoning. Also involves the mobilization of different resources depending on the context in order to determine reasonable conclusions or courses of action, based on a set of criteria.¹¹

D

DIGITAL CITIZENSHIP

Having the ICT equipment and skills to participate in a digital society, for example to access government information online, to use social networking sites, and to use a mobile phone.¹²

DIGITAL COMPETENCY

Ability to find, organize, understand, evaluate, create and disseminate information using digital technology. Multi-faceted and includes ICT skills, social and collaborative skills, and cognitive skills. Also includes the ability to behave ethically and responsibly. Digital competency is related to civic obligations governed by the *Criminal Code* as well as by various laws regarding the protection of privacy and personal information, copyright and intellectual property.¹³

DIGITAL CONTENT

Any type of content that exists in the form of digital data, and that can be created, viewed, distributed, modified and stored using computers or any other digital device.¹⁴

DIGITAL LITERACY

Knowledge and skills that enable a person to use, understand, assess, engage and create in a digital context and, more generally, to participate in society. Consequently, digital literacy is not limited to technological knowledge. It also includes numerous ethical and social practices applied daily in workplaces and learning environments as well as in recreational and everyday activities.¹⁵

DIGITAL TECHNOLOGY

All information production, storage, processing, dissemination and exchange techniques and technologies, as well as information applications, including artificial intelligence systems. Refers without distinction to information and communications technologies, digital technologies, digital infrastructures and the data these produce and collect.¹⁶

¹¹ Based on M. Gagnon, "Proposition d'une grille d'analyse des pratiques critiques d'élèves en situation de résolution de problèmes dits complexes," *Recherches qualitatives* 30, no. 2 (2011): 122-147; and D. F. Halpern, "The Nature and Nurture of Critical Thinking," in *Critical Thinking in Psychology*, eds. R. J. Sternberg, H. L. Roediger III and D. F. Halpern (Cambridge, United Kingdom: Cambridge University Press, 2007): 1-14.

¹² UNESCO, *UNESCO ICT Competency Framework for Teachers* (Paris: UNESCO 2011), <http://unesdoc.unesco.org/images/0021/002134/213475e.pdf>.

¹³ *Stratégie numérique du Québec*. [Translation]

¹⁴ Based on R. Vuorikari, Y. Punie, S. Carretero and L. V. den Brande, *DigComp 2.0: The Digital Competence Framework for Citizens, Update Phase 1: The Conceptual Reference Model* (Luxembourg: European Commission, 2016), <https://ec.europa.eu/jrc/en/publication/eur-scientific-and-technical-research-reports/digcomp-20-digital-competence-framework-citizens-update-phase-1-conceptual-reference-model>.

¹⁵ *Stratégie numérique du Québec*. [Translation]

¹⁶ *Stratégie numérique du Québec*. [Translation]

DIGITAL TOOLS

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

Subject-specific digital tools

Technologies (tools, software, applications) designed and used specifically for teaching or learning in a particular subject.

Educational digital tools

Technologies (tools, software, applications) designed and used specifically for teaching or learning, and for pedagogical purposes.

Technological digital tools

Technologies (tools, software, applications) designed and used specifically for teaching or learning technological skills.¹⁷

DIMENSION

Structural component of the *Digital Competency Framework*. Twelve dimensions have been selected, each of which encompasses a number of elements.

E

EMPOWERMENT

Act of allowing or enabling a person or group to function autonomously.¹⁸

ENTREPRENEURIAL COMPETENCIES

Series of skills enabling an individual to enhance a concept, idea or product, take risks, and demonstrate initiative and leadership in order to complete a project.¹⁹

F

FILTER BUBBLE

Process of the algorithmic personalization of information reaching a particular user. The resulting filtering of information can result in digital isolation.

G

GRANTING OF AUTHORITY

With regard to information, refers to the process by which information is determined to be credible or reliable.

¹⁷ Based on R. Legendre, *Dictionnaire actuel de l'éducation*, 3rd ed. (Montréal: Guérin, 2005); and R. Vuorikari, Y. Punie, S. Carretero and L. V. den Brande, *DigComp 2.0: The Digital Competence Framework for Citizens, Update Phase 1: The Conceptual Reference Model* (Luxembourg: European Commission, 2016), <https://ec.europa.eu/jrc/en/publication/eur-scientific-and-technical-research-reports/digcomp-20-digital-competence-framework-citizens-update-phase-1-conceptual-reference-model>.

¹⁸ Québec. Office québécois de la langue française, s.v. "Autonomisation," http://gdt.oqlf.gouv.qc.ca/fiche0qlf.aspx?ld_Fiche=505959. [Translation]

¹⁹ Based on Ontario Ministry of Education, *21st Century Competencies: Foundation Document for Discussion, Phase 1: Towards Defining 21st Century Competencies for Ontario* (2016), http://www.edugains.ca/resources21CL/About21stCentury/21CL_21stCenturyCompetencies.pdf.

I

ICT

Information and communications technologies, which include desktop and laptop computers, mobile phones, tablets and other digital information processing and transmission devices. Refers to both hardware and software.²⁰

INFORMATION COMPETENCY

See *Information Literacy*

INFORMATION LITERACY SKILLS (ILS)

Ability to recognize how to ethically collect, use, manage, synthesize and create content. Includes information-handling skills such as the ability to determine the need for information and to access, locate, understand and produce it, as well as the ability to engage in the collaborative production and sharing of information in digital environments in order to ensure effective information use.²¹

INFORMATION LITERACY

Series of cognitive skills and abilities, and cultural and social practices associated with the way information content is handled. Includes information literacy skills, a reflective attitude toward information and its uses, and an understanding of and critical distance from information issues.²²

INNOVATION

Creation and introduction of new or significantly improved goods, services and processes in a market and in various user environments. For instance, may involve the implementation of new or significantly improved methods of production or distribution, marketing or organization.²³

L

LEARNER

One who acquires skills or knowledge . . . through instruction, experience, or training.²⁴

LITERACY

Ability to understand and employ [written] information in daily activities, at home, at work and in the community.²⁵

²⁰ UNESCO, *UNESCO ICT Competency Framework for Teachers* (Paris: UNESCO, 2011), <http://unesdoc.unesco.org/images/0021/002134/213475e.pdf>.

²¹ Based on Association of College and Research, *Framework for Information Literacy for Higher Education* (Chicago, IL: American Library Association, 2016), <http://www.ala.org/acrl/standards/ilframework>.

²² Based on A. Serres, "Questions autour de la culture informationnelle," *Canadian Journal of Information and Library Science* 31, no. 1 (2007): 69-85.

²³ *Stratégie numérique du Québec*. [Translation]

²⁴ Termium, s.v. "Learner," http://www.btb.termiumplus.gc.ca/tpv2alpha/alpha-eng.html?lang=eng&i=1&srchtxt=learner&index=alt&codom2nd_wet=1#resultrecs.

²⁵ Québec, Ministère de l'Éducation et de l'Enseignement supérieur, *Digital Action Plan for Education and Higher Education* (2019), http://www.education.gouv.qc.ca/fileadmin/site_web/documents/ministere/PAN_Plan_action_VA.pdf; and Termium, s.v. "Literacy," http://www.btb.termiumplus.gc.ca/tpv2alpha/alpha-eng.html?lang=eng&i=1&srchtxt=literacy&index=alt&codom2nd_wet=1#resultrecs.

M

MEDIAS

Mass communication through physical or digital means.²⁶

MEDIA LITERACY

Critical understanding of media, the techniques they employ and their effects.²⁷

O

ONLINE

Content on the Internet or a network, particularly websites, cloud computing and email.²⁸

ONLINE LEARNING

Method of learning based on the use of new technologies providing access to online, interactive and sometimes personalized education on the Internet, an intranet or another electronic medium in order to develop competencies, making the learning process independent of time and place.²⁹

P

PROBLEM SOLVING

Process of developing an adequate understanding or representation of a problem, and of seeking and implementing a satisfactory solution. A problem is considered to be complex if it has multiple possible solutions or can be solved in various ways, or if its purpose is not explicitly disclosed.³⁰

S

SELF-CRITICISM

Ability or attitude that enables individuals to make critical judgments about their own performance or results, or about the quality of their work or process.³¹

SOFTWARE

Application or program that includes a set of instructions that enable a device (personal computer, tablet, telephone, etc.) to provide functions.³²

²⁶ C. Wilson, A. Grizzle, R. Tuazon, K. Akyempong and C.-K. Cheung, *Media and Information Literacy: Curriculum for Teachers* (France: United Nations Educational, Scientific and Cultural Organization, 2012), 186, <http://www.unesco.org/new/fr/communication-and-information/resources/publications-and-communication-materials/publications/full-list/media-and-information-literacy-curriculum-for-teachers>.

²⁷ Ibid.

²⁸ UNESCO, *UNESCO ICT Competency Framework for Teachers* (Paris: UNESCO, 2011), <http://unesdoc.unesco.org/images/0021/002134/213475e.pdf>.

²⁹ Québec, "Thésaurus de l'activité gouvernementale," s.v. Apprentissage en ligne, <http://www.thesaurus.gouv.qc.ca/tag/terme.do?id=877>. [Translation]

³⁰ Based on R. Legendre, *Dictionnaire actuel de l'éducation*, 3rd ed. (Montréal: Guérin, 2005).

³¹ Ibid.

³² UNESCO, *UNESCO ICT Competency Framework for Teachers* (Paris: UNESCO, 2011), <http://unesdoc.unesco.org/images/0021/002134/213475e.pdf>.

T

TECHNO-PEDAGOGY

Science that studies teaching methods involving new information and communications technologies (NICT). Techno-pedagogy offers teachers the support and services they need to enhance their pedagogical practices through the use of NICT.³³

TWENTY-FIRST-CENTURY COMPETENCIES

Competencies, including literacy and numeracy, that are essential for learning and the development of digital skills. They encompass qualities and aptitudes such as critical thinking, problem solving, communication and collaboration, entrepreneurial spirit, the ability to harness the potential of digital technologies and resources, creativity and innovation. They also include other qualities such as self-determination and personal management, social responsibility, and cultural, global and environmental awareness.³⁴

U

UNIVERSAL DESIGN FOR LEARNING (UDL)

A framework for use of technology to maximize learning opportunities for every learner.³⁵

³³ Québec, Ministère de l'Éducation et de l'Enseignement supérieur, *Digital Action Plan for Education and Higher Education* (2019), http://www.education.gouv.qc.ca/fileadmin/site_web/documents/ministere/PAN_Plan_action_VA.pdf; and Office québécois de la langue française, s.v. "Technopédagogie," http://gdt.oqlf.gouv.qc.ca/ficheOqlf.aspx?ld_Fiche=8360644. [Translation]

³⁴ *Stratégie numérique du Québec*. [Translation]

³⁵ Based on Projet CUA, "Pour un enseignement supérieur inclusif," *Les applications pédagogiques de la conception universelle de l'apprentissage* (2015), <http://cua.uqam.ca/>.

