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DIGITAL COMPETENCY DEVELOPMENT CONTINUUM

DIGITAL COMPETENCY
FRAMEWORK

Title of original document:

*Continuum de développement de la compétence numérique,
Cadre de référence de la compétence numérique*

English version

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Direction du soutien au réseau éducatif anglophone
Ministère de l'Éducation et de l'Enseignement supérieur

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An electronic version of this document is available on the Ministère's website at:
www.education.gouv.qc.ca.

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Ministère de l'Éducation et de l'Enseignement supérieur

ISBN 978-2-550-86550-6 (PDF)

Legal deposit - Bibliothèque et Archives nationales du Québec, 2020

19-00446-A

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INTRODUCTION

The *Digital Competency Development Continuum* defines the scope of the elements of the 12 dimensions of digital competency and situates them on a progress matrix consisting of three possible levels: beginner, intermediate and advanced. The continuum plays an important role in the implementation of the *Digital Competency Framework* by associating specific behaviours, situations or contexts with each of these levels. The continuum can therefore provide the foundation for pedagogical activities aimed at developing digital competency through a progressive inter-level approach.

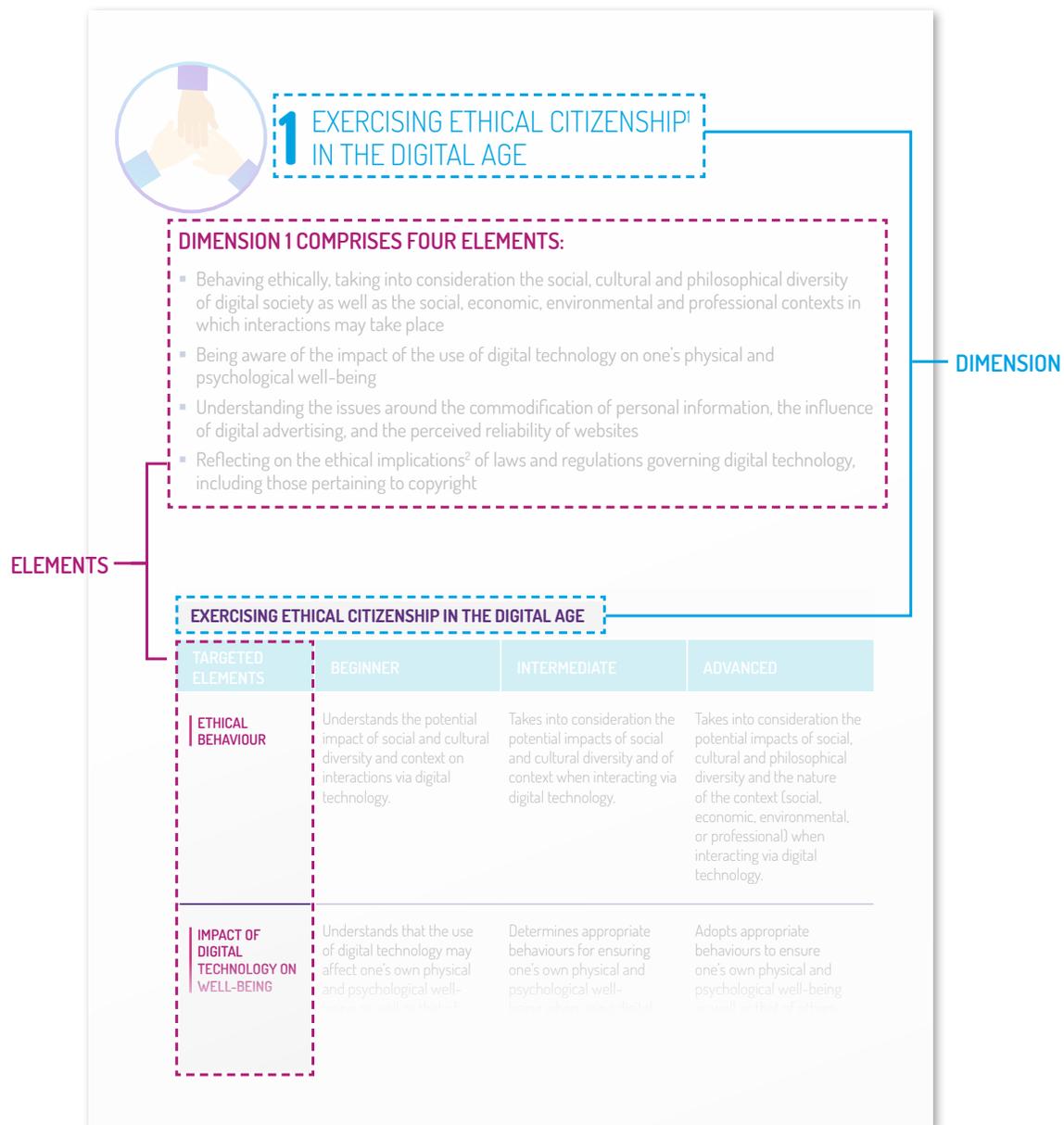
For the purposes of this continuum, matrices were designed to illustrate learner progress in each of the framework dimensions. The matrices set out the steps involved in the development of digital competency. In other words, it is understood that advanced learners are also expected to master beginner level outcomes. Thus, pedagogical activities may be designed to reinforce outcomes for the current development level or for prior development levels.

For each dimension, sample themes are proposed that can be explored at every educational level. Although themes may be associated with a specific dimension of digital competency, many of them can be explored in connection with more than one dimension. For example, copyright may be addressed when developing the dimension *Exercising ethical citizenship in the digital age*, but it can also be explored through the dimensions *Producing content via digital technology* and *Adopting an innovative and creative approach to the use of digital technology*.

The continuum has been designed independently of any specific program of study or educational level. All learners are encouraged to strive for an advanced level of competency, although what constitutes advanced competency may differ depending on the level in regular or higher education.

STRUCTURE OF THE CONTINUUM

The *Digital Competency Development Continuum* is based on the *Digital Competency Framework*: it builds on the framework's 12 dimensions and associated elements, i.e. the content items that appear beneath each of the dimensions in the framework. In the continuum, key words are used to designate the various elements. For example, the element *Being aware of the impact of the use of digital technology on one's physical and psychological well-being* (Dimension 1) becomes *Impact of digital technology on well-being*.



THREE LEVELS OF COMPETENCY DEVELOPMENT

Each dimension is presented accompanied by a matrix that illustrates the three levels of competency development: beginner, intermediate and advanced. These three levels, each of which is characterized by a set of behaviours and attitudes, reflect the progress made by learners as they develop their digital competency.

BEGINNER

Learners are able to:

- **identify** appropriate digital tools and resources based on the context or their needs
- **understand** different phenomena related to a given dimension
- **recognize** the usefulness or benefits of digital technology in certain contexts

INTERMEDIATE

Learners are able to:

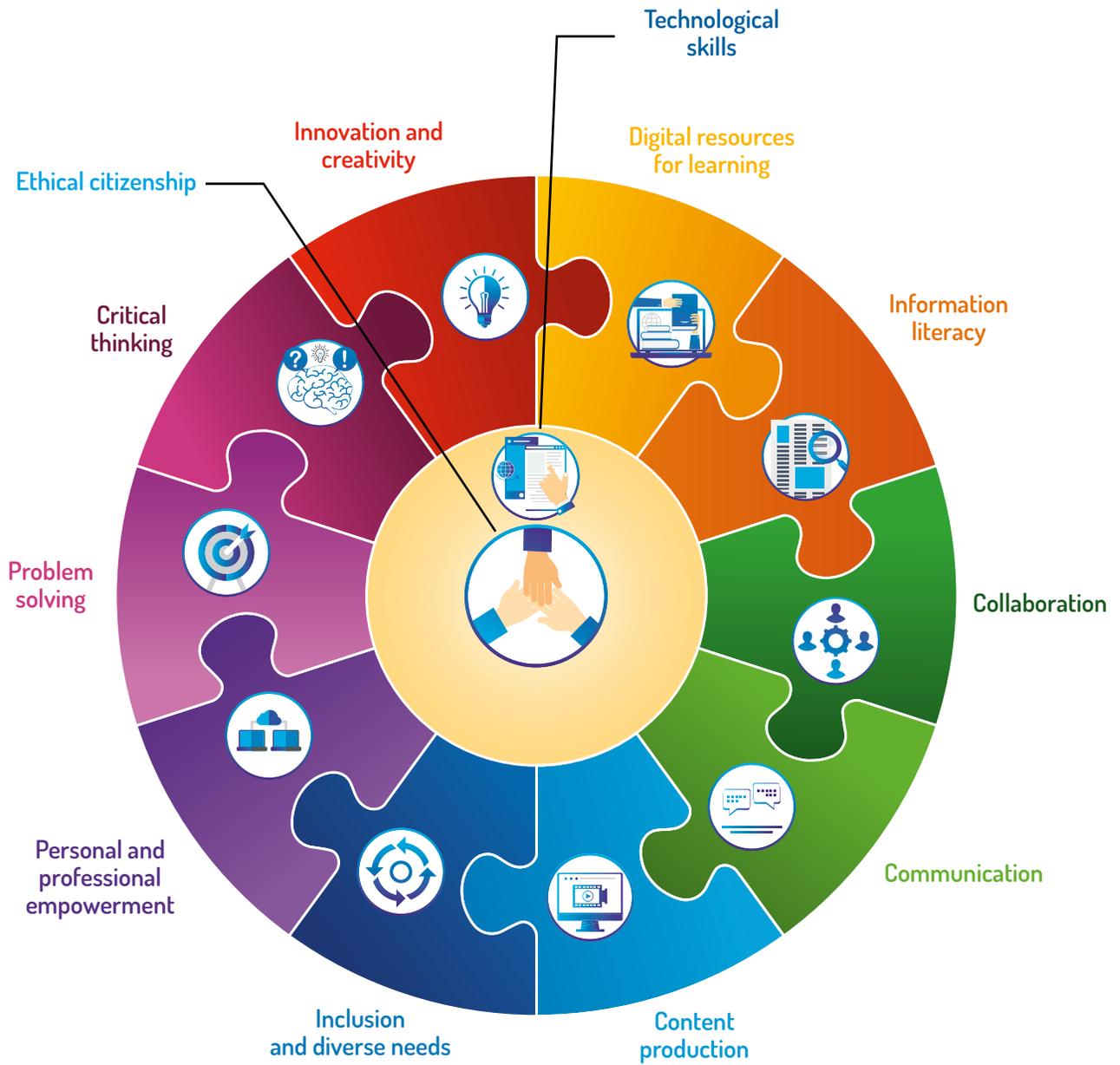
- **use** or **mobilize** appropriate digital tools and resources based on the context or their needs
- **understand** complex phenomena related to a given dimension
- **utilize** digital technology in different ways in a variety of contexts

ADVANCED

Learners are able to:

- **choose** and **combine** appropriate digital tools and resources based on the context or their needs
- **develop** or **implement** a variety of strategies for the use of digital technology
- **analyze** or **evaluate** digital tools, resources or content
- **be proactive** and **show leadership** in a variety of contexts involving the use of digital technology

DEVELOPMENT CONTINUUM OF THE VARIOUS DIMENSIONS





1 EXERCISING ETHICAL CITIZENSHIP¹ IN THE DIGITAL AGE

DIMENSION 1 COMPRISES FOUR 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 implications² of laws and regulations governing digital technology, including those pertaining to copyright

SAMPLE THEMES

- | | | |
|-------------------------------------|---|---|
| ▪ Digital technology in health care | ▪ Cyberbullying | ▪ Website reliability |
| ▪ Ergonomics | ▪ Cyber sexual violence | ▪ Commodification of personal information |
| ▪ Citizen engagement | ▪ Identity theft | ▪ Digital advertising |
| ▪ Internet addiction | ▪ Phishing | ▪ E-commerce |
| ▪ Copyright | ▪ Social inclusion via digital technology | ▪ Green and digital economy |

¹ Here, ethical citizenship is understood to refer to the ability to take a step back when considering ethical issues.

² Reflecting on ethical implications (or ethical reflection) consists of reflecting in a carefully reasoned manner in order to determine the right thing to do. Québec, Commission de l'éthique en science et en technologie, "Quelle est la différence entre éthique et morale?" Accessed April 24, 2020, <http://www.ethique.gouv.qc.ca/fr/ethique/quest-ce-que-lethique/quelle-est-la-difference-entre-ethique-et-morale.html>.

EXERCISING ETHICAL CITIZENSHIP IN THE DIGITAL AGE

TARGETED ELEMENTS	BEGINNER	INTERMEDIATE	ADVANCED
ETHICAL BEHAVIOUR	Understands the potential impact of social and cultural diversity and context on interactions via digital technology.	Takes into consideration the potential impacts of social and cultural diversity and of context when interacting via digital technology.	Takes into consideration the potential impacts of social, cultural and philosophical diversity and the nature of the context (social, economic, environmental, or professional) when interacting via digital technology.
IMPACT OF DIGITAL TECHNOLOGY ON WELL-BEING	Understands that the use of digital technology may affect one's physical and psychological well-being as well as that of others.	Determines appropriate behaviours for ensuring one's physical and psychological well-being when using digital technology.	Adopts appropriate behaviours to ensure one's own physical and psychological well-being as well as that of others where digital technology is involved, such as being proactive in reporting problematic situations.
ISSUES RELATED TO DIGITAL TECHNOLOGY	Understands several issues related to digital technology.	Understands how issues related to digital technology affect one's own use.	Understands how issues related to digital technology affect society.
ETHICAL REFLECTION	Understands the meaning of the regulations governing one's use of digital technology.	Reflects on the ethical implications of the laws and regulations governing one's use of digital technology in order to develop guidelines that promote greater social harmony.	Reflects on the ethical implications of the laws and regulations governing the use of digital technology in order to adopt a position on the use of digital technology, develop new rules or guidelines, or propose improvements in order to promote greater social harmony.



2 DEVELOPING AND MOBILIZING TECHNOLOGICAL SKILLS

DIMENSION 2 COMPRISES EIGHT 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

SAMPLE THEMES

- | | | |
|------------------------------------|---|---|
| ▪ Programming languages | ▪ Data sharing technologies (e.g. Wi-Fi, Bluetooth) | ▪ Secure passwords |
| ▪ Digital file formats | ▪ Artificial intelligence applications (e.g. personal assistants) | ▪ Security software (e.g. antivirus, firewalls) |
| ▪ Internet of Things ³ | ▪ Cloud computing | ▪ Robotics |
| ▪ Energy-efficient data management | ▪ Algorithm development | |

³ This theme corresponds to the following definition: «A series of interconnected objects that collect data, and the associated telecommunications networks and data processing platforms.» [Translation] Office québécois de la langue française, *Le grand dictionnaire terminologique*, Accessed April 24, 2020. http://gdt.oqlf.gouv.qc.ca/ficheOqlf.aspx?ld_Fiche=26544585

DEVELOPING AND MOBILIZING TECHNOLOGICAL SKILLS

TARGETED ELEMENTS	BEGINNER	INTERMEDIATE	ADVANCED
ARTIFICIAL INTELLIGENCE (AI)	Develops an understanding of the concept of artificial intelligence and its applications in everyday life.	Understands how AI-driven applications influence device functions and how they are used.	Understands the global impacts of artificial intelligence on education, society, culture and politics.
EMERGING ISSUES	Develops an understanding of emerging issues concerning digital technology.	Understands how emerging issues concerning digital technology impact society in different ways.	Keeps current on emerging issues concerning digital technology and the impact such issues have on all aspects of society.
UP-TO-DATE DIGITAL SKILLS	Understands the benefits of new technologies, especially their potential to improve a person's ability to accomplish diverse tasks.	Learns to use new technologies to improve one's ability to accomplish diverse tasks.	Learns to use new technologies and keep digital skills up to date, in an ongoing, proactive manner.
COMPUTATIONAL THINKING AND COMPUTER PROGRAMMING	Develops an understanding of the general principles of computer programming in order to enhance computational thinking as well as basic programming skills.	Creates and executes simple computer programs.	Creates and executes computer programs that can be used to meet diverse everyday needs.
PERSONAL DATA	Understands the importance of protecting personal data when using digital technology and knows some ways of doing so.	Secures all personal data by adopting safe behaviours when using digital technology.	Secures personal data at all times, in an ongoing, proactive manner.

TARGETED ELEMENTS	BEGINNER	INTERMEDIATE	ADVANCED
USE OF DIGITAL TOOLS	Uses an appropriate digital tool to accomplish a task.	Uses appropriate digital tools to accomplish a variety of tasks.	Chooses a variety of digital tools and uses them effectively to accomplish a range of complex tasks.
DEVICE OPERATION	Explores how everyday devices function on a mechanical, electronic and computer level.	Understands the connections between the different ways everyday devices function on a mechanical, electronic and computer level.	Analyzes how everyday devices function in order to determine the root cause (mechanical, electric, or computer-related) of a problem.
FIXING TECHNICAL ISSUES	Identifies technical issues and asks for help to fix them.	Fixes technical issues that arise when using personal digital devices.	Offers to help fix a variety of technical issues.



3 HARNESSING THE POTENTIAL OF DIGITAL RESOURCES FOR LEARNING

DIMENSION 3 COMPRISES THREE 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

SAMPLE THEMES

- | | | |
|---|---|------------------------|
| ▪ Online encyclopedias | ▪ Learning games and applications | ▪ Distance learning |
| ▪ Computer-assisted writing tools and resources | ▪ Virtual reality and augmented reality | ▪ Flipped classrooms |
| ▪ Productivity software and applications | ▪ Active feedback | ▪ Independent learning |

HARNESSING THE POTENTIAL OF DIGITAL RESOURCES FOR LEARNING

TARGETED ELEMENTS	BEGINNER	INTERMEDIATE	ADVANCED
COMPETENCY DEVELOPMENT	Understands how digital technology can be used to (co-)develop subject-specific or (techno-)pedagogical competencies.	Uses digital technology appropriately to (co-)develop competencies.	Adopts an appropriate digital strategy to (co-)develop competencies in a variety of learning situations.
TOOLS AND RESOURCES	Identifies appropriate tools and resources for a learning activity.	Uses appropriate tools and resources for a learning activity, including for self-assessment.	Chooses appropriate tools and resources to meet needs observed during a learning activity or to conduct self-assessment.
CURIOSITY AND NEW HORIZONS	Identifies situations where a digital resource might feed one's curiosity and expand one's horizons, thus increasing one's desire to learn.	Feeds one's curiosity and expands one's horizons by consulting a variety of relevant digital resources.	Whets the curiosity and expands the horizons of one's peers by mobilizing relevant digital resources.



4 DEVELOPING AND MOBILIZING INFORMATION LITERACY

DIMENSION 4 COMPRISES SIX 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

SAMPLE THEMES

- | | | |
|---------------------------------|---|--------------------------------|
| ▪ Online libraries | ▪ Keywords | ▪ Filter bubbles |
| ▪ Search engines | ▪ Boolean operators and logical operators | ▪ Search results display order |
| ▪ Reference management software | ▪ Research filters (e.g. date, country, language) | ▪ Online reviews and comments |
| ▪ Media literacy | | |

DEVELOPING AND MOBILIZING INFORMATION LITERACY

TARGETED ELEMENTS	BEGINNER	INTERMEDIATE	ADVANCED
INFORMATION SELECTION AND USE	Understands the importance of carefully selecting information for use, while remaining mindful of information overload.	Selects appropriate information for use, while remaining mindful of algorithms that influence access to information.	When selecting information, mobilizes strategies to limit the undesirable effects of algorithms that influence access to information.
RESEARCH STRATEGY	Recognizes that there are different ways to search for information, and that the extent to which a particular way may be useful depends on the need being met.	Plans and implements an appropriate research strategy in order to meet a particular need.	Adopts a personalized research strategy to find relevant information easily, such as setting up information notifications.
MOBILIZATION OF RESOURCES	Understands the importance of mobilizing resources during research, by taking such steps as asking content experts or information specialists for assistance.	Mobilizes resources to find relevant information, including by consulting an information specialist (e.g. librarian).	Implements a strategy that involves mobilizing complementary resources in order to find relevant information.
ASSESSMENT OF INFORMATION	Recognizes the characteristics that can be used to assess the reliability of information.	Uses a number of criteria to assess the reliability of digital information.	Assesses various types of digital information, including information published on social media, using appropriate criteria to determine source and content reliability.
ANALYSIS OF INFORMATION	Recognizes the benefits of organizing research results for analysis.	Organizes research results for analysis.	Adopts a strategy to efficiently organize research results from different sources in order to facilitate analysis.
REFLECTIVE ATTITUDE TOWARD INFORMATION	Identifies the contexts in which information is produced.	Understands that the context in which information is produced may impact its credibility.	Adopts a reflective attitude toward information by considering the contexts in which information is produced and the purposes for which it is employed.



5 COLLABORATING VIA DIGITAL TECHNOLOGY

DIMENSION 5 COMPRISES FIVE 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

SAMPLE THEMES

- | | | |
|---|---|-----------------------------------|
| ▪ Collaborative productivity applications | ▪ Display or tracking of collaborators' changes | ▪ Virtual collaborative boards |
| ▪ File-sharing and storage tools | ▪ Collaborative writing | ▪ Project management applications |

COLLABORATING VIA DIGITAL TECHNOLOGY

TARGETED ELEMENTS	BEGINNER	INTERMEDIATE	ADVANCED
OPPORTUNITIES FOR COLLABORATION	Identifies situations in which it is possible to collaborate via digital technology.	Participates in a collaborative project by making proper use of media or digital environments.	Steers a collaborative project by making proper use of media or digital environments.
TOOL SELECTION AND USE	Identifies appropriate digital collaboration tools for a given situation.	Chooses appropriate digital collaboration tools for a given situation from among other similar tools, and uses them properly.	Chooses appropriate digital collaboration tools from among other similar tools based on the context, the objective and collaborators' needs and uses them properly.
INTERPERSONAL SKILLS	Is mindful of one's role as part of a group working on a collaborative project using digital technology.	Collaborates respectfully and effectively with others while using digital technology.	Acts proactively to promote respectful, effective collaboration.
COMMUNITY	Recognizes that it is possible to contribute to a community via digital technology.	Proposes to carry out a collaborative project for a community by leveraging digital technology as well as personal skills.	Gets actively involved in the community by mobilizing digital technology to make the most of personal skills.
CO-CREATION	Understands that digital tools can facilitate the co-creation process.	Uses appropriate digital tools during the co-creation process.	Steers a co-creation project by using a variety of appropriate digital tools.



6 COMMUNICATING VIA DIGITAL TECHNOLOGY

DIMENSION 6 COMPRISES FOUR 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

SAMPLE THEMES

- | | | |
|----------------------------------|--------------------------------|---------------------|
| ▪ Chatting and virtual messaging | ▪ Group chats | ▪ Social networks |
| ▪ Email | ▪ Video calls | ▪ Discussion boards |
| ▪ Text messaging | ▪ SMS language (abbreviations) | ▪ Emojis |

COMMUNICATING VIA DIGITAL TECHNOLOGY

TARGETED ELEMENTS	BEGINNER	INTERMEDIATE	ADVANCED
APPROPRIATE COMMUNICATION	Identifies a number of general rules or conventions that apply to digital communication: for example, appropriate language or greetings.	Independently applies a number of general rules and conventions to digital communications.	Adapts digital communications to the intended recipients through proper application of rules and conventions.
TOOL SELECTION AND USE	Understands that there are a lot of digital communication tools and that certain tools may be more appropriate than others for a given situation.	Uses appropriate digital communication tools based on the situation.	Chooses appropriate digital communication tools and uses them properly in different situations.
DIVERSE ACTIVITIES	Learns about diverse digital communication strategies and associated tools for use in the context of an educational, professional or everyday activity.	Adopts a suitable digital communication strategy and associated tools based on the context of an educational, professional or everyday activity.	Adopts an appropriate strategy for the use of communication tools in a variety of situations.
CONFIDENTIALITY OF COMMUNICATIONS	Makes a distinction between public digital communications and private digital communications, and understands the importance of safeguarding the confidentiality of private communication.	Recognizes the guidelines that must be followed in order to safeguard the confidentiality of digital communications, depending on the recipient and type of communication.	Outlines the essential guidelines for safeguarding the confidentiality of digital communications.



7 PRODUCING CONTENT VIA DIGITAL TECHNOLOGY

DIMENSION 7 COMPRISES FOUR 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

SAMPLE THEMES

- Sharing and reading apps for multimedia content
- Multimedia content production software
- Podcasts and videos
- Digital content file formats (e.g. MP3, JPEG)
- Intellectual property (e.g. Creative Commons licences)
- Content directories (e.g. royalty-free stock photo banks)
- 3D printers

PRODUCING CONTENT VIA DIGITAL TECHNOLOGY

TARGETED ELEMENTS	BEGINNER	INTERMEDIATE	ADVANCED
CONTENT PRODUCTION	Recognizes that the content produced using digital technologies may be influenced by the objectives and context of the educational, professional or everyday activity.	Uses digital technologies to produce content in keeping with the objectives and context of the particular educational, professional, or everyday activity.	Mobilizes appropriate digital technologies to produce relevant content adapted to different components of the activity (e.g. its aim, objectives, or context).
TOOL SELECTION AND USE	Understands that there are many digital production tools and that tools can be selected based on one's needs.	Chooses appropriate digital production tools and uses them appropriately to meet a need.	Employs an appropriate strategy to select and use digital production tools based on needs.
MEDIA	Identifies different media that can be used to exploit digital data (e.g. text, sound and images).	Uses media to exploit digital data.	Combines several types of media to exploit different forms of digital data simultaneously.
CONSULTATION OF CONTENT	Understands that content can be a source of inspiration, and that ethical conventions and legal regulations (e.g. copyright) govern the use of content.	Consults content and uses some of it as inspiration for one's own creations, in compliance with ethical conventions and legal regulations.	Consults and uses a variety of content as inspiration for one's own creations, in compliance with ethical conventions and legal regulations.



8 USING DIGITAL TOOLS TO FOSTER INCLUSION AND ADDRESS DIVERSE NEEDS

DIMENSION 8 COMPRISES THREE 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

SAMPLE THEMES

- Internet access
- Digital divide
- Universal Design for Learning (UDL)
- Learning difficulties
- Assistive technology tools for writing
- Inclusive pedagogy
- Students with disabilities
- Giftedness

USING DIGITAL TOOLS TO FOSTER INCLUSION AND ADDRESS DIVERSE NEEDS

TARGETED ELEMENTS	BEGINNER	INTERMEDIATE	ADVANCED
DIVERSE NEEDS	Understands that some personal needs may be met by mobilizing appropriate digital tools and resources.	Mobilizes tools and resources to address diverse needs and overcome barriers.	Employs a strategy to properly use tools and resources, and mobilizes them to address diverse needs and overcome barriers.
TOOL SELECTION AND USE	Understands the necessity of analyzing personal needs in order to select the proper tools.	Chooses appropriate tools and resources and uses them properly to meet personal needs.	Analyzes personal needs in order to select and use the proper tools and resources.
ACCESSIBILITY CONSTRAINTS	Recognizes different (cultural, physical, technical and economic) constraints to accessing digital tools and resources.	Understands that the usefulness of digital tools and resources in meeting needs may be limited by accessibility constraints.	Analyzes accessibility constraints in order to assess how useful specific tools and resources may be in meeting diverse needs in a variety of contexts.



9 MOBILIZING DIGITAL TECHNOLOGY FOR PERSONAL AND PROFESSIONAL EMPOWERMENT⁴

DIMENSION 9 COMPRISES FOUR 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

SAMPLE THEMES

- Job search websites
- Resume resources
- Self-training
- Trades and occupations directories
- Professional orders and associations
- Digital badges
- Start-ups
- Crowdfunding

⁴ 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.

MOBILIZING DIGITAL TECHNOLOGY FOR PERSONAL AND PROFESSIONAL EMPOWERMENT

TARGETED ELEMENTS	BEGINNER	INTERMEDIATE	ADVANCED
PROFESSIONAL LIFE	Understands the pertinence of using digital technology to develop competencies for use in one's current or future professional life.	Uses digital tools and resources to develop or maintain relevant competencies for use in one's current or future professional life.	Mobilizes multiple complementary resources to develop and maintain relevant competencies for use in one's current or future professional life.
ENTREPRENEURIAL COMPETENCIES	Understands how digital tools and resources can be used to undertake a project autonomously.	Mobilizes appropriate digital tools and resources to undertake and carry out a project autonomously.	Employs appropriate digital tools and resources and demonstrates leadership in undertaking and carrying out a project.
INTEGRATION INTO THE WORKFORCE	Recognizes the benefits of mobilizing digital technology to help one integrate into the workforce.	Uses digital technology to help one integrate into the workforce, especially by promoting one's skills to future employers.	Makes optimal use of different digital tools to help one integrate into the workforce and to foster one's professional development.
CONTINUING EDUCATION	Identifies relevant digital resources to keep up to date on new developments in a professional field that corresponds to one's fields of interest.	Mobilizes digital resources to keep up to date on new developments in a professional field that corresponds to one's fields of interest.	Develops and implements a digital resource plan in order to develop skills and meet one's continuing education needs throughout one's career.



10 SOLVING DIVERSE PROBLEMS VIA DIGITAL TECHNOLOGY

DIMENSION 10 COMPRISES FOUR ELEMENTS:

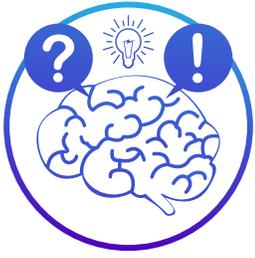
- Analyzing a situation to obtain an accurate, thorough understanding of a problem, and developing and implementing a satisfactory solution
- Asking for or offering assistance to develop a collaborative solution, particularly in the context of digital communities
- Mobilizing a variety of resources and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

SAMPLE THEMES

- Tutorials
- Help forums
- Design thinking
- Cognitive maps and concept maps
- Authentic tasks
- Multidisciplinary problems

SOLVING DIVERSE PROBLEMS VIA DIGITAL TECHNOLOGY

TARGETED ELEMENTS	BEGINNER	INTERMEDIATE	ADVANCED
UNDERSTANDING OF A PROBLEM	Understands the benefits of using digital technology to obtain an accurate understanding of complex problems.	Uses digital tools and resources to obtain an accurate understanding of a complex problem and develop a plan to solve it.	Chooses appropriate digital tools and resources, based on one's needs, in order to obtain an accurate understanding of complex problems and develop a plan to solve them.
COLLABORATIVE SOLUTIONS	Understands the pertinence of using digital technology to ask for assistance to solve problems.	Asks for assistance from digital communities to develop collaborative solutions to solve problems.	Mobilizes multiple resources, including digital communities, to develop collaborative solutions to a variety of problems.
CREATIVE PROBLEM-SOLVING	Recognizes the importance of being creative and mobilizing resources to solve problems.	Solves problems by using digital resources creatively.	Solves problems creatively by combining appropriate digital tools and resources.
EVALUATION OF APPROACH	Understands how digital technology can be mobilized to evaluate and improve one's approach to problem-solving.	Uses digital technology to improve one's approach to problem-solving, particularly by identifying the most effective methods or means.	Uses digital technology to evaluate one's approach to problem-solving, particularly by comparing one's approach to those of experts in order to improve it.



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

DIMENSION 11 COMPRISES FOUR ELEMENTS:

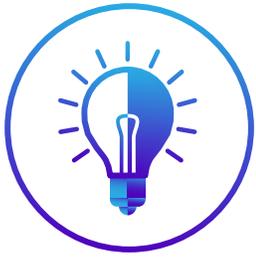
- Employing critical thinking to assess digital content before using it
- Deliberately developing one's critical judgment regarding digital technology, based on rigorous analytical criteria through the use and comparison of digital resources
- Making a thoughtful and honest assessment of one's own use 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

SAMPLE THEMES

- | | | |
|----------------------------|------------------------|--|
| ▪ Fake news | ▪ Social bots | ▪ Environmental impacts of digital devices |
| ▪ Social media influencers | ▪ Internet giants | ▪ Targeted advertising |
| ▪ Trolls | ▪ Planned obsolescence | ▪ Geolocalization |
| ▪ Algorithms | | |

DEVELOPING CRITICAL THINKING WITH REGARD TO THE USE OF DIGITAL TECHNOLOGY

TARGETED ELEMENTS	BEGINNER	INTERMEDIATE	ADVANCED
ASSESSMENT OF DIGITAL CONTENT	Understands that digital content can be fake, biased or outdated and learns a method for assessing it.	Uses a list of predetermined criteria to properly assess the credibility of digital content.	Employs critical thinking in order to properly assess a variety of digital content, in order to determine which content to consult.
ANALYTICAL CRITERIA	Identifies rigorous analytical criteria for assessing or comparing digital content.	Applies rigorous analytical criteria to compare or assess digital content.	Chooses rigorous and appropriate analytical criteria, based on specific needs, to adequately assess digital content.
HONEST ASSESSMENT OF USE	Recognizes the impact of the use of digital technology, both on oneself and on society.	Makes an honest assessment of one's own use of digital technology, given the benefits and disadvantages of digital technology.	Makes a thoughtful assessment of one's own use of digital technology, given the benefits and disadvantages of digital technology for both oneself and society.
ISSUES CONCERNING DIGITAL TECHNOLOGY	Understands the issues concerning the use of digital technology and technological developments.	Analyzes issues concerning the use of digital technology and technological developments, including by determining the benefits and limitations of digital technology.	Uses critical thinking to take a position on issues concerning media, scientific advances, technological developments and the use of digital technology.



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

DIMENSION 12 COMPRISES FOUR ELEMENTS:

- Developing the ability to make innovative use of digital technology for creative projects in an artistic, personal or professional context
- Using or developing innovative 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

SAMPLE THEMES

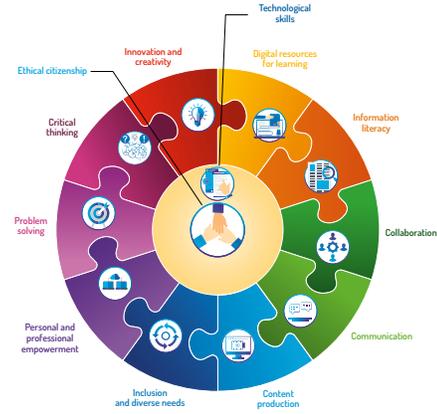
- Ideation (creative process)
- Appropriated technologies
- Creative labs
- Prototyping
- Hackathons
- Start-ups

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

TARGETED ELEMENTS	BEGINNER	INTERMEDIATE	ADVANCED
CREATIVE PROJECTS	Understands the benefits of using digital technology to innovate or carry out creative projects.	Uses appropriate digital tools and resources to innovate or carry out creative projects.	Combines complementary digital tools and resources, based on specific needs and in a variety of contexts, to innovate or carry out creative projects.
INNOVATIVE APPROACHES	Recognizes the benefits of following an innovative approach ⁵ to improve or create objects, projects or processes.	Employs innovative approaches that use digital technology to improve or create objects, projects or processes.	Develops personalized innovative processes that use digital technology to create objects, projects or processes.
CREATIVE EXPRESSION	Identifies appropriate digital resources to nurture or express one's creativity.	Nurtures or expresses one's creativity by finding inspiration in appropriate digital resources.	Shares one's accomplishments via digital technology to express one's own creativity or nurture that of others.
RECEPTIVITY	Understands the benefits of being receptive to innovation and creative projects by others.	Demonstrates receptivity to innovation and to a variety of creative projects.	Demonstrates receptivity to constructive feedback from others regarding one's innovations or creative projects.

⁵ See definition of *innovation* in the glossary of the *Digital Competency Framework* (Gouvernement du Québec, 2019).

APPENDIX – ABRIDGED VERSION OF THE CONTINUUM



DIMENSION	BEGINNER	INTERMEDIATE	ADVANCED
EXERCISING ETHICAL CITIZENSHIP IN THE DIGITAL AGE	Understands the issues, laws, and regulations concerning digital technology, as well as the impact of such technology.	Reflects on ethical implications in order to ensure proper and thoughtful personal use of digital technology.	Reflects on ethical implications in order to adopt a position on the laws and regulations governing the use of digital technology as well as the impact of such use.
DEVELOPING AND MOBILIZING TECHNOLOGICAL SKILLS	Develops technological skills while demonstrating an understanding of the issues concerning digital technology, keeping one's digital skills up to date and maintaining one's ability to use digital tools to accomplish diverse tasks.	Mobilizes technological skills while understanding how issues concerning digital technology influence society, and uses the proper digital tools for various tasks.	Makes use of one's technological skills while keeping up to date and demonstrating a general understanding of issues concerning digital technology, and choosing the appropriate digital tools, based on one's needs, to accomplish diverse tasks.
HARNESSING THE POTENTIAL OF DIGITAL RESOURCES FOR LEARNING	Identifies situations and resources that can foster learning, and understands how these can be mobilized.	Uses digital tools and resources to (co-)develop competencies, conduct self-assessment, feed one's curiosity and expand one's horizons.	Implements a strategy for choosing and using appropriate digital tools and resources to (co-)develop competencies, conduct self-assessment, feed one's curiosity and expand one's horizons.

DIMENSION	BEGINNER	INTERMEDIATE	ADVANCED
DEVELOPING AND MOBILIZING INFORMATION LITERACY	Develops information literacy by determining different research methods and recognizing that information can be assessed based on its characteristics and production context.	Mobilizes information literacy by planning and undertaking research, assessing the information collected by applying criteria and taking the production context into account.	Utilizes information literacy to plan and implement a personalized research strategy to search for information, and mobilizes relevant criteria to assess a variety of information, while adopting a reflective attitude toward such information.
COLLABORATING VIA DIGITAL TECHNOLOGY	Identifies situations in which it is possible to collaborate via digital technology and tools, and understands that certain behaviours can facilitate collaboration.	Collaborates respectfully by using appropriate digital tools in order to produce co-creations, among other things.	Acts proactively to initiate a collaborative project or co-creation via digital technology, selecting appropriate tools based on the context or needs.
COMMUNICATING VIA DIGITAL TECHNOLOGY	Understands the different types of digital communications, knows about several digital communication tools, and identifies rules and conventions governing different types of communications.	When communicating, applies certain rules governing digital communications and uses appropriate digital tools.	Chooses appropriate digital tools, based on the context and one's needs, to adapt one's communication to its recipients while correctly applying rules and conventions.
PRODUCING CONTENT VIA DIGITAL TECHNOLOGY	Understands that the context, data or tools used can influence content produced via digital technology, and understands the benefits of consulting other types of content for inspiration.	Produces content by using digital data and tools appropriately and consulting other content for inspiration while respecting copyright.	Chooses appropriate digital data and tools to produce content that is adapted to specific needs, using content as a source of inspiration and being careful to respect copyright.

DIMENSION	BEGINNER	INTERMEDIATE	ADVANCED
USING DIGITAL TOOLS TO FOSTER INCLUSION AND ADDRESS DIVERSE NEEDS	<p>Understands that certain personal needs may be met through digital technology and that it is therefore useful to analyze one's needs as well as the characteristics of digital tools and resources in addition to any accessibility constraints.</p>	<p>Uses appropriate digital tools and resources to meet a personal need, taking into consideration the tools' characteristics as well as any accessibility constraints.</p>	<p>Analyzes needs in order to select the appropriate tools and resources to meet diverse needs in a variety of contexts.</p>
MOBILIZING DIGITAL TECHNOLOGY FOR PERSONAL AND PROFESSIONAL EMPOWERMENT	<p>Understands the benefits and ways of using digital technology to develop competencies for use in one's current or future professional life, to help one integrate into the workforce, and to keep up to date on new developments in a field of interest.</p>	<p>Uses digital tools and resources to develop competencies for use in one's current or future professional life, to help one integrate into the workforce, and to keep up to date on new developments in a field of interest.</p>	<p>Makes proper use of a variety of digital tools and resources to develop competencies for use in one's current or future professional life, to help one integrate into the workforce, and to keep up to date on new developments in a field of interest.</p>
SOLVING DIVERSE PROBLEMS VIA DIGITAL TECHNOLOGY	<p>Understands the benefits of using digital technology to solve a problem, especially for obtaining a thorough understanding of the problem, asking for assistance, developing one's creativity or evaluating one's approach.</p>	<p>Uses digital tools and resources to solve a problem creatively, by obtaining a thorough understanding of the problem, asking for assistance, and evaluating one's approach in order to improve it.</p>	<p>Uses various digital tools and resources that are suited to the context and one's needs in order to understand or solve a variety of problems creatively, or to evaluate one's approach.</p>

DIMENSION	BEGINNER	INTERMEDIATE	ADVANCED
<p>DEVELOPING CRITICAL THINKING WITH REGARD TO THE USE OF DIGITAL TECHNOLOGY</p>	<p>Understands the issues concerning digital technology, the impact of digital technology may have on one personally, and the need to establish criteria for assessing whether digital content is fake or biased.</p>	<p>Uses a list of predetermined criteria in order to assess digital content, make an honest assessment of one's own use of digital technology and analyze any issues related to it.</p>	<p>Employs critical thinking to assess digital content as well as one's own use of digital technology, and is able to take a position on issues concerning digital technology.</p>
<p>ADOPTING AN INNOVATIVE AND CREATIVE APPROACH TO THE USE OF DIGITAL TECHNOLOGY</p>	<p>Understands how digital tools and resources may be used to innovate or be creative, and recognizes the importance of being receptive to the creative projects of others.</p>	<p>Uses digital tools and resources to innovate or carry out creative projects, while also remaining open to the creative projects of others.</p>	<p>Combines digital tools and resources, based on the context and one's needs, in order to innovate or carry out creative projects, while also remaining open to feedback.</p>



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