

# Core competencies in the digital field

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Identification and implementation  
in compulsory secondary education

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# Foreword

The government of the Generalitat de Catalunya, through its Department of Education, is promoting and spearheading a political initiative in favour of school success which aims to involve and secure the commitment of all of Catalan society with the goal of improving educational outcomes and lowering school failure and dropout rates.

The European Union has established educational objectives as part of the Europe 2020 Strategy (ET-2020), which should make it possible for the EU to achieve an intelligent, inclusive and sustainable economy. Catalonia has agreed on these objectives, which requires it to focus the government's efforts on improving school outcomes and citizens' educational level in order to achieve full lifelong personal, professional and social development.

On the other hand, in accordance with article 97 from LEC (Law 12/2009, July 10, education), schools hold pedagogical autonomy, out of the curricular framework established in the Decree 187/2015 of August 25, of the organization of the compulsory secondary education, where key competencies, contents and evaluation criteria are specified.

Likewise, according to the provisions of articles 58 and 59 of the LEC (Law on Education of Catalonia 12/2009, dated the 10<sup>th</sup> of July), the competencies needed to use new technologies must be adequately developed in both primary and compulsory secondary education.

The document we are now presenting contains the core competencies in the **digital field** for compulsory secondary education. Given their transversal, instrumental nature, these competencies are linked to all the other subjects in the curriculum. To attain them, students must have access to the devices and different applications. Likewise, schools must welcome students' experiences and knowledge of digital environments which they have acquired outside of school and then complete them with academic contents and relate them to more technical aspects.

The elements making up this document provide information on the grading of attainment of the competencies in the digital field by the end of compulsory secondary education, identify the key contents associated with each competency, provide methodological guidelines to apply in the classroom, provide examples of assessment activities with indicators on the different degrees of attainment and contain a compilation of reference websites from the Department of Education where a variety of teaching resources can be found, as well as a glossary of terms related to digital competencies.

This document has been written with the participation of university professionals and teachers from schools in Catalonia. The effort should contribute to making headway in improving the quality of our country's educational system, the professional development of our teachers and ultimately our students' educational success.

**Irene Rigau i Oliver**

Minister of Education

# Introduction

The Department of Education has drawn up this document containing guidelines for implementing core competencies in the field of information and communication technologies for students in compulsory secondary education (abbreviated ESO - *educació secundària obligatòria* in Catalan) with the goal of helping schools to develop and apply the curriculum currently in force in the digital field.

The document outlines, grades, guides and evaluates one of the guiding principles of the educational system contained in the Law on Education of Catalonia (LEC) which refers to the competency involving the ability to use digital systems independently and creatively, and it outlines a coherent implementation of this principle in line with accreditation of the competency and the provisions of Decree 89/2009 dated 9 June 2009 regulating the Accreditation of Competencies in Information and Communication Technologies (ACTIC).

Likewise, in terms of the role that digital technologies should play in learning, this document is in line with the conclusions of the 22<sup>nd</sup> Reflection Conference held by the School Council of Catalonia on the impact and contribution of digital technologies in education, as approved by the Plenary of the School Council of Catalonia in its session held on the 9<sup>th</sup> of April 2013.

The elements comprising this document are the dimensions, the competencies with their corresponding graded levels, the key contents for each competency, the grading of how these competencies are attained and the methodological and assessment guidelines for each competency. The document concludes with six annexes and a glossary.

When developing this document, we chose to define four dimensions that categorise digital competencies into the following classification areas, which are coherent with the curriculum currently in place: devices and applications; information processing and organizing work and learning environments; interpersonal communication and collaboration; and citizenship, habits, civic-mindedness and digital identity.

These dimensions have shared elements which weave constant connections among the competencies. For example, the first dimension on devices and applications is related to all the other dimensions in that devices and applications such as words, machines and programmes are needed to develop the other dimensions. Likewise, the fourth dimension, citizenship, habits, civic-mindedness and digital identity, which examines ethics, legal issues and security, is a core dimension in all the others. These relationships are reflected in Annexe 1 of this document.

Below, each competency comes with a general explanation which outlines the conceptual landmarks through which this competency is developed and the criteria used to grade attainment of the competency.

For each competency, we have included key contents which are specific to the digital field but can be worked on in any subject. One of the fundamental elements in schools' LKT Plan must be the organization and strategies needed to ensure that the contents are attained by all students.

Some of these specific digital competencies may fall within more than one competency, as shown in Annexe 2. One example is lifelong learning: virtual learning environments; resources for formal and informal online learning; and ethical and legal considerations in the publication, authorship, communication and use of information are all contents that appear in the majority of competencies.

Each competency has been graded into three levels of attainment: basic (level 1), intermediate (level 2) and high (level 3), which range from simple attainment of the competency to excelling in it bearing in mind that the attainment of each level implies prior attainment of the previous levels.

The relationship between competencies and achievement levels can be reviewed in Annexe 3.

The criteria used to scaffold the competencies are related to the complexity of the applications, the strategies used and the levels of abstraction needed for students to learn about the technology, from the technology and especially with technology.

The acquisition of the core competencies in the field of the information and communication technologies requires specific ways of working which encourage their development. The methodological guidelines outline several ways of accomplishing this. Methodological factors like detecting and correcting errors as a source of learning and solutions to problematic situations as engaging challenges are factors to be borne in mind in all the digital competencies.

Given the instrumental nature of digital competencies, they should be linked to all the subjects in the curriculum. Therefore, Annexe 4 includes a proposal to relate digital key contents with the rest of curricular fields, making a difference between implicit knowledge, practical learning and content learning. In order to attain them, students must have access to the devices and different applications. All of this should contribute to ensuring that students further their learning while developing responsible, appropriate attitudes towards their own digital identity and lifelong learning.

Likewise, schools should welcome students' previous experiences and knowledge of digital environments which they have acquired outside of school and then complement them with more academic concepts and interrelate them with more technical considerations, curricular contents and language registers.

In the Knowledge Society, digitalisation means changes throughout the entire learning cycle: from the search for and processing of information to the generation of new (personal) knowledge to transmitting this knowledge. The instructor should bear in mind that since knowledge is constructed through interaction with one's surroundings, digital applications are yet another part of this interaction as active agents, from the spellcheck – just to mention one well-known application – to the use of all kinds of devices (school-owned, individual, mobile, etc.).

Regarding attention to student diversity, we should consider the multiple channels providing access to information (written, audio, visual and audiovisual) and resources in terms of both understanding and expressing knowledge, which expands the range of possibilities for personalising learning.

The methodological guidelines come with proposals of general activities in some of the competencies to help students attain them. Assessment guidelines are also provided in line with these methodological guidelines. There are several indicators for each graded level of competency.

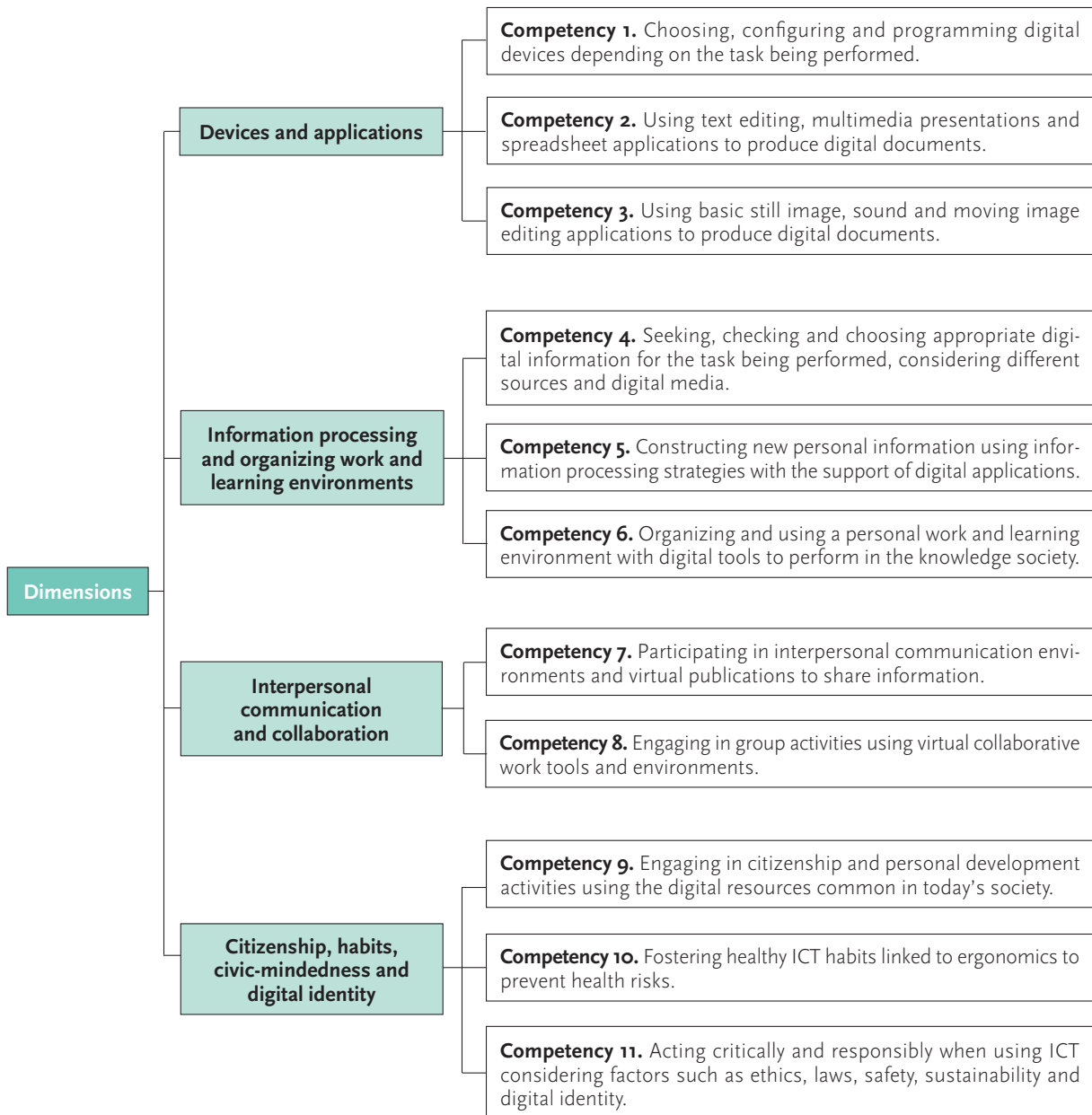
Some assessment guidelines conclude with a sample activity linked to a context in which the use of digital devices should bring a substantial enhancement of learning. The activities proposed are often quite complex, given that they aim to cover most of the aspects within the competency while also being solvable in different ways so that students can demonstrate their entire range of knowledge.

To illustrate the cross-cutting nature of digital competencies, we have striven to ensure most of the subjects are represented in the proposed activities, as can be seen in Annexe 5. Despite this, we should note that given the polyvalent nature of the activities, the majority of proposals can easily be associated with many different subjects just by making a few simple changes.

Digital competencies implement the contents described in this document, but they should be viewed as cross-curricular competencies which should contribute to an overall improvement in all learning. To this end, the Department of Education has a variety of reference websites which contain a wide array of materials, as shown in Annexe 6.



# Core competencies in the digital field



# Devices and applications dimension

This instrumental dimension encompasses three competencies and refers to the ability to independently, effectively and efficiently use the different digital devices and the applications that may come with them in order to complete tasks including robotics and programming in the broadest sense. It particularly covers the processing of textual, numerical and audiovisual data, along with the production of text and multimedia documents, still images, drawings, graphics, sounds and animated images.

All digital devices require a certain level of knowledge and skill to handle them as a step prior to using them for a specific intention or purpose. For this reason, this competency includes more technical aspects related to the proper use of each device and their applications or programmes.

The host of devices and applications around today makes it difficult to predict the scenario in the near future, especially the kinds of devices and applications that will be around and how they will integrate with each other. We have to be aware of this issue since the goal is more to be competent in using the digital devices which exist at any given point in time than to be competent in all the models and options that are around. In today's context, this dimension will materialise in devices such as personal computers, digital tablets, interactive whiteboards (IWB), cameras and mobile phones.

Given the wide variety and number of applications available to create digital documents (in open code and with user licences, local and online, specific and generic, etc.), and given that technological evolution leads us to predict further development and continuous changes, this competency revolves around empowering students to produce documents, regardless of the kind of application used. Each school's educational project and LKT plan should determine the most suitable devices and applications for classwork.

## COMPETENCY 1

### Choosing, configuring and programming digital devices depending on the task being performed

#### Description

This competency refers to properly choosing and using digital devices meant as interfaces: computers, peripherals, mobile telephones, cameras, tablets, etc., along with knowledge of the basic functionalities of their programming, bearing in mind the tasks to be performed.

Knowledge of the adaptability of devices should also make them accessible to students' different needs while facilitating and personalising their learning.

Robotics and programming in their broad sense are integrated into this competency. Programming refers to the use of different languages associated with controlling devices, web languages and others, while robotics encompasses the application of programming to operate devices and sensors, automatically gather data, etc.

To grade this competency, we have considered the level of complexity of the tasks to be performed: choosing devices for the first level; choosing and determining the settings of the devices for the second level; and choosing, determining the settings and programming them for the third level.

Basic functionalities of devices means the most elementary functionalities inherent to any device, the right settings for the task, its suitability to the digital environment, as well as the storage and publication of the tasks performed, if needed.

Here, digital work environments mean environments made up of different digital devices, the interconnections between them and the security and storage aspects of the data revolving around them.

#### Grading

- 1.1. Choosing digital devices and using their basic functionalities depending on the task to be performed.
- 1.2. Choosing and determining the settings of digital devices and to use their basic functionalities.
- 1.3. Choosing, determining the settings and programming digital work environments while considering interconnectivity and security factors.

#### Key contents

- Basic functionalities of devices (computer, printer, digital tablet, camera, video camera, mobile phones, etc.): file and programme searches, execution of applications locally and online, storage, printing, determining settings and installing programmes, etc.
- Kinds of connections between devices: by cable (network, HDMI, VGA, USB, etc.), wireless (Wi-Fi, 3G, etc.).
- Data storage and backup copies: stationary, removable and virtual.
- Basic contents of operating systems.
- Computer security: antiviruses, firewalls, backup copies, password management, etc.
- Robotics and programming: didactic robots, simulators, programming environments, automats, algorithms, etc.
- Virtual and augmented reality: video games, bookmarks, two-way codes, geolocation, etc.
- Projection systems: projector, whiteboard, etc.
- Audiovisual language: still images, sound and video.

## Methodological guidelines

Students must be aware of the variety and potentialities of devices available in the world today and know how to use them and determine their settings in order to exercise judgement and sound criteria to acquire the elements that will meet their needs in their personal, social, education and work lives.

In order to gradually acquire this competency, the instructor should present learning situations which enable them to practice aspects related to the competency based on real needs, either personal or at school. Likewise, activities from any other digital competency or curricular subject can lead to situations in which contents related to the selection, use and functionality of digital devices can be worked on.

Regarding robotics, there are numerous tools and possibilities that can provide ways to approach to this subject, including programmable robots, tools and programming environments, simulators or programmable calculators. In this case, the kind of activities proposed can range from guided problem-solving to simulations, searches and tests of different situations.

Therefore, within the field of programming languages, information on the digital world must be introduced which can be expanded over time. Examples include some of the simpler aspects of HTML, creating links, colour codes, insertion codes, etc., along with aspects related to metadata: RSS, geolocation, geotagging, descriptive data on a song or photograph, etc.

Below are some proposed activities in which the contents of this competency can be applied:

- Integrating productions made with different devices to create a school magazine, a class calendar, photo albums, etc.
- Creating a multimedia album on a curricular project to share online.
- Creating a videogame related to the curricular contents.
- Doing a project that includes programming of educational robots.
- Creating algorithms that are based on problem-solving through either simulations or programmable devices.
- Using web cameras and other devices to record observations both with the naked eye and using optical devices (microscope, binoculars, etc.).
- Using the interactive digital whiteboard to make project presentations to the entire class.
- Using mobile devices to create and capture data (photographs, videos, audio, sensors, geolocation, etc.) and later process them into an integrated production.
- Putting into practice knowledge of devices and their interactivity into practice by taking advantage of celebrations and special events at school.
- Proposing problem-solving scenarios in which the students have to break the problem down into simpler ones which after solved must then be put back together to resolve the initial problem, thus encouraging computational thinking.
- ...

## Assessment guidelines

The acquisition of the competency will be evaluated gradually over time, bearing in mind the constant evolutions inherent in the digital world. Students may experience major changes in how they handle digital devices based on greater skill in using them as well as significant changes in the choices and possibilities that these devices offer.

The grid below includes some of the indicators that can be used to assess the graded levels to which students have acquired this competency.

Level 1	Level 2	Level 3
Selects the right devices for each need.	Determines the settings of devices depending on each situation.	Optimises the use of the devices they have.
Uses the basic functions of digital devices.	Manages to install and update programmes related to digital devices.	Takes well-reasoned decisions that affect the management, settings and data of digital devices.
With the help of a tutorial, determines the settings of the operating system in order to use digital devices more efficiently depending on their needs.	Determines the settings of the operating system in order to use digital devices more efficiently depending on their needs.	
Takes care of digital devices and the data they contain.	Exchanges data among several different devices.	Has set up a system to protect and retrieve digital data.
Follows instructions to resolve and construct logical sequences associated with programming and computational thinking.	Independently resolves and constructs simple problems that entail the use of logical sequences associated with programming and computational thinking.	Independently resolves and constructs simple problems at differing levels of complexity that entail the use of logical sequences associated with programming and computational thinking.
...	...	...

## COMPETENCY 2

### Using text editing, multimedia presentations and spreadsheet applications to produce digital documents

#### Description

This competency refers to the use of local and online applications to produce digital documents in different formats through text editing, numerical data processing and graphic representations of these data, and developing multimedia presentations by inserting already-existing audiovisual elements.

Creating documents is traditionally one of the most frequent tasks when working with digital devices, and it is also one of the most common practices and uses of digital technologies. The kinds of documents that can be generated today are quite diverse in terms of both their format and the possibility of sharing these documents with others and generating them through collaborative work in digital environments.

For the grading of the competency, we have considered the level of complexity in the production of digital documents, and this will depend on the functionalities used (basic or standard) and the complexity of the document generated.

By basic functions we mean the most essential, simple functions of each of the applications, such as, creation, format, document management, spell checker, tables, formulae and simple calculations. By standard functions we mean the functionalities used the most often to draw up documents, such as, headings, footers, animations or relative references. By complex documents we mean those that bring together different kinds of elements from different sources, in each case using the text editing, multimedia presentations, numerical processing and graphic representation functions needed.

#### Grading

- 2.1.** Developing documents using the most basic text editing, multimedia presentations, numerical processing and graphic representation functions.
- 2.2.** Developing documents using the standard text editing, multimedia presentations, numerical processing and graphic representation functions.
- 2.3.** Developing complex documents using standard functions and other functions depending on needs..

#### Key contents

- Data storage and backup copies: stationary, removable and virtual.
- Basic contents of operating systems.
- Editing tools for text documents, multimedia presentations and spreadsheets.
- Audiovisual language: still images, sound and video.
- Ethics and legal issues in the use and installation of programmes, communication systems, etc.
- Knowledge building: techniques and devices.
- Personal learning portfolios (digital portfolios).
- Lifelong learning: Personal Learning Environments. Resources for formal and non-formal learning in the Web.
- Digital identity visibility, reputation and management of one's own privacy as well as others.

## Methodological guidelines

In order to develop this competency, the best approach is to begin by practising the most basic uses and functions of the different kinds of digital documents and then to gradually include the standard functions while subsequently introducing the more specific functions of any given programme as needed.

In order to acquire the competency, students should have enough chances to gain skill in making the digital documents needed to complete the activities in any curricular subject, including writing reports and summaries, presenting projects, making automated calculations, showing numerical data, etc.

There is a wide variety of tools that make it possible to work with these kinds of documents. Freeware text editing programmes (OpenOffice, LibreOffice, etc.) can be used, or programmes which require a user license (Microsoft Office, Pages, etc.), or online programmes (Google Drive). Given this variety, the basic parameter which should determine the use of any given tool should be students' ability to access it, in addition to personal choice.

The teacher should encourage an independent attitude in students when resolving the small problems that arise when using IT applications by looking for tutorials on the Internet or participating in reference forums or specialised web portals. Despite this, sometimes the teacher or other classmates may have to intervene to support the process of completing the task. At other times, a previous explanation should be given to introduce new concepts or common guidelines. It is also possible to debrief at the end of an activity so students can share and assess the different alternatives used and determine how suitable they were in completing the task.

Below are several sample activities which could be performed in all the curricular subjects:

- Drafting a wide variety of texts which can be enriched with links, images, graphics illustrating data, etc.
- Making presentations which support public speaking or to be posted online.
- Making spreadsheets to gather and process data, apply formulas, render graphics, etc.
- ...

## Assessment guidelines

The assessment of this competency is linked to the tasks and activities involved in creating and developing different kinds of documents, which are often part of a learning process that connects with other competencies, especially competencies 4, 5 and 11, as well as with other subject areas.

When evaluating this competency, it is important to pay attention to the more formal aspects and technical skills, given that the academic accuracy of the contents should be evaluated in the corresponding subject area course.

The best time to evaluate is at the end of an activity, when students have a completed document. Still, it is very useful to regularly track students' acquisition of the competency over time because knowledge on how to use applications changes constantly with the advent of new programmes on the market.

Below are some of the indicators which determine the degree to which this competency has been attained:

Level 1	Level 2	Level 3
Develops a document (text, presentation or spreadsheet) using the basic functions.	Develops a document using some standard functions.	Develops a document with the standard functions.
Designs a document (text, presentation) with a simple organization.	Designs a document with an organization that makes it easier to read.	Designs a coherent document by organizing the sections and contents in a balanced fashion.
Applies the spellcheck for different languages.		
Uses a regular font and the sections are coherent (titles, subtitles, line spacing, etc.).	Knows how to use strategies to change the format.	Additional elements were used to format the document better, such as templates.
Enters the data in a spreadsheet in simple formats (texts and numbers).	Applies standard formats: date, currency (€)...	Applies the conditional format, compound units of measurement...
On a spreadsheet, uses formulas for calculations with the basic operations, parentheses and intervals using data with different formats.	Uses basic functions (SUM, AVERAGE, COUNT, etc.).	Uses basic functions and some advanced functions (IF, OR, etc.) with relative data.
Generates graphics by manually entering the data.	Automatically generates different kinds of graphics based on data in the spreadsheet.	Automatically generates graphics and modifies the legend.
Includes tables, graphs, links and images in the document with guidance.	Independently includes tables, graphs, links and images in the document.	
Stores the document correctly using logical criteria.		
...	...	...



## COMPETENCY 3

### Using basic still image, sound and moving image editing applications to produce digital documents

#### Description

This competency refers to creating multimedia productions by capturing, creating and editing still images, moving images and sound materials that already exist or are previously recorded, using both local and online digital media.

Students must know how to use devices that allow them to capture, create and store sound and still and moving images, how to manipulate their features (size, format, etc.) and how to edit different documents in order to yield a finished multimedia product, which may include a variety of elements.

It should be borne in mind that both the swift evolution of devices and applications and their use outside school mean that the amount of time students need to acquire knowledge of this competency may vary widely, but the goal is that when students complete their compulsory education they have all mastered them sufficiently to make multimedia productions and to adapt to new applications in the future.

For the grading of this competency, we have considered the complexity of the resulting multimedia product, the combination of different audiovisual elements and the editing functions used, either basic or standard, for editing still images, sound and moving images and for multimedia editing.

For our purposes, by multimedia production we mean simple productions where formats are not combined. By basic functions we mean those that are the most characteristic and simple of each application, such as, image search, voice recording, edition tools, file export and import, formats and publishing. Standard functions are those that are used the most often when developing documents in general; they encompass the basic functions. By standard functions we mean, for example, layers and filters, tracks, remixes and effects, speed and animation. We have not considered

advanced functions, which normally only experts use in very specific documents.

The productions created may use the student's own recordings or recordings made by others, always considering licenses on derivative works (see competency 11).

#### Grading

- 3.1. Making simple multimedia productions based on one's own or others' materials, applying the basic functions of editing programmes.
- 3.2. Making multimedia productions based on one's own or others' materials, applying the basic functions of editing programmes.
- 3.3. Making multimedia productions based on one's own or others' materials which combine a variety of audiovisual materials, applying the standard functions of editing programmes.

#### Key contents

- Basic functionalities of devices.
- Data storage and backup copies: stationary, removable and virtual.
- Basic contents of operating systems.
- Audiovisual language: still images, sound and video.
- Ethics and legal issues in the use and installation of programmes, communication systems, etc.
- Knowledge building: techniques and devices.
- Personal learning portfolios (digital portfolios).
- Lifelong learning: Personal Learning Environments. Resources for formal and non-formal learning in the Web.
- Digital identity visibility, reputation and management of one's own privacy as well as others.

## Methodological guidelines

The attainment of this competency involves the use of applications and programmes related to audiovisuals (sound, still images and moving images) at differing levels of expertise with the goal of creating productions that include one or several of these elements. Therefore, the first step is for students to have the chance to use the different options existing to capture sound and still and moving images, and for them to put their knowledge of these tools into practice to create their productions.

The instructor should be capable of harnessing students' prior knowledge of these elements which they may have acquired outside of school in order to complete it with academic contents and relate it to technical aspects and audiovisual language. Instructors should offer examples of the task assigned to students and provide them with tutorials when the task is more complex.

Both individual and group work should be assigned. Collaborative projects and shared multimedia productions offer advantages such as the exchange of knowledge on how the applications are used, while individual tasks ensure that all students acquire the knowledge.

Thus, students must know which formats and resolutions are right for the task assigned and manipulate the characteristics of the files to adapt them to the need of each teaching and learning activity (images to be projected, video to be watched on the Internet, etc.). This manipulation should be used to modify files based on artistic criteria and using the different sound, image and video editing tools.

Instructors should ensure that the end productions are complex, in the sense that they are products that include sound and still and moving images which have been captured and edited by students, both individually and collaboratively, and have been developed in compliance with the ethics and legal issues of audiovisual applications and productions, a factor which is directly related to competency 11.

The teachers in the different curricular areas should ask students to perform tasks related to the contents of their areas which include the creation of different kinds of audiovisual materials at differing levels of complexity. Instructors should ensure that students are familiar with the tools they should use to perform the assigned tasks and, if needed, they should demonstrate how they are used and offer them a model which they can use as a template of the activity they are being asked to perform.

Below are some examples of activities:

- Taking photographs to construct a digital album.
- Developing a digital poster that includes sound, still images and video on a topic for any curricular subject.
- Creating a sound story by linking sounds that have been recorded or culled from a sound bank.
- Videoing a news programme.
- Creating a tourism route of a familiar place based on the use of different online applications to edit still images, sounds and moving images.
- Developing a presentation of photographs with audio (background music, off-screen narration, etc.).
- Recording a radio programme to be broadcast on the Internet (podcast).
- Developing audio guides.
- ...

The resulting product may be everything from simple creations that do not require combinations of different audiovisual elements (such as a digital photograph album) to complex creations that include different kinds of audiovisual elements (such as moving images with background music and credits). Either kind of product can be posted online, thus linking this competency with competency 7 and competency 11, the latter in terms of image copyrights.

## Assessment guidelines

Assessment of this competency must be linked to technical aspects and should not encompass the curricular subject for which the product has been made, given that attainment of digital competencies can be seen in the formal aspects, in this case digital documents with still images, sound or video which can be combined with each other to create productions that are more or less complex.

Below are several indicators of attainment of this competency according to the three levels:

Level 1	Level 2	Level 3
Has captured sound, photographs and video.	Has captured sound, photographs and video and has used the criteria of audiovisual language with guidance.	Has captured sound, photographs and video and has used the criteria of audiovisual language independently.
Edits with guidance.	Edits independently.	The product has been edited independently by including a variety of files.
Has recorded videos.	Has published sound, images and videos.	Has included sound, images and videos in digital environments.
Recognises different formats of multimedia files and knows how to convert them with guidance.	Recognises different formats of multimedia files and knows how to convert them independently.	Recognises different formats of multimedia files and knows how to convert them independently while applying file size criteria.
Includes a variety of multimedia files with guidance.	Includes a variety of multimedia files.	Includes any multimedia file regardless of its kind.
...	...	...

Below is an example of an assessment activity for this competency:

In the Social Studies, Geography and History class, a cross-curricular project can be suggested in conjunction with Visual Arts, Music, Language and Literature, and Latin and Classical Culture, where students have to create a multimedia product in which they share the biography of a famous person to be posted on the school's website. The instructor can assess the use of tutorials when making the multimedia production for the students who may need it.

**Create a multimedia project in which you tell the biography of a famous musician, painter, sculptor, writer or other famous person, relating their biography and works with their historical context.**

**In order to make the presentation, you have to perform the following tasks:**

- a) Choose different images to illustrate the person's biography and works while respecting copyright.**
- b) Record yourself reading a script you have written containing the biography and the explanations of their works which you deem important.**
- c) Produce a multimedia creation in which includes your reading of the biography and their works as the images change.**
- d) Choose background music while respecting copyright.**
- e) Include the credits in your multimedia production.**

**You should also consider the most appropriate format for a subsequent publication of your project.**

This activity can be evaluated by applying the following table of assessment criteria:

Activity title: Biography in pictures			Student name:	
	Level 1	Level 2	Level 3	Assessment
Audio recording	Orally records the text on the biography and works in a comprehensible way without background noise, using a specific device (recording device, mobile telephone, etc.).	Orally records the text on the biography and works with a minimum quality using a specific programme or application and adjusts this file to the characteristics of the end product (size, format, synchronisation with images).	Orally records the text on the biography and works using a specific programme or application, adjusts this file to the characteristics of the end product and adds a sound effect like fade-in or fadeout.	
Music and sound effects	Chooses music while respecting copyright and includes it with the narration.	Chooses music while respecting copyright, includes it in the production and edits some of its characteristics using specific programmes (format and volume adjustment).	Chooses music while respecting copyright, includes it in the production, edits some of its characteristics using specific programmes and adds sound effect(s).	
Image processing	Uses different images to illustrate the events recounted in the biography and works while respecting copyright.	Uses different images to illustrate the events explained in the biography and works while respecting copyright, and standardises their characteristics (size, resolution, format, tone and brightness).	Uses different images to illustrate the events explained in the biography and works while respecting copyright, standardises their characteristics and edits them with an effect (red eyes, saturation, partial retouching, etc.).	
Multimedia production	Creates a complete multimedia production in video format based on sound and image files, includes credits and publishes it with guidance.	Creates a complete multimedia production in video format based on sound and image files, includes credits and publishes it.	Creates a complete multimedia production in video format based on sound and image files, includes credits, adds some editing effects (transitions) and publishes it.	

# Information processing and organizing work and learning environments dimension

This dimension, which includes three competencies, refers to capacities related to the search for and selection of information (on the Internet and local networks), cognitively processing it in order to transform it into knowledge, and the organization of personal digital work and learning environments where we can store and work on the information that is used and produced. It considers the efficient use of a variety of techniques and strategies according to the sources and digital media used, as well as the systematisation and planning of these strategies in an educational setting.

Our world today is characterised by the extraordinarily swift circulation of information and a plethora of digital data of all kinds, where the media and formats in which they are presented are constantly multiplying; likewise, access to information has diversified so much that it requires new skills and resources. As a result, even though the abilities to find and process information are not exclusive to the digital world, they do merit special attention.

The most important part of this dimension is not only to acquire useful skills in order to organize work environments and find and process information, but even more importantly to learn how to use this information critically and responsibly to resolve issues and questions in everyday life and to handle it appropriately in personalised digital environments. In short, the goal is to make the most of and wisely use digital resources for lifelong learning.

## COMPETENCY 4

### Seeking, checking and choosing appropriate digital information for the task being performed, considering different sources and digital media

#### Description

This competency refers to the search for digital information, especially on the Internet, which comes in a variety of formats: text, documents, audio, images, videos, maps, etc. Information searches should be planned based on objectives, which will determine the type, the sources and the digital media to be used.

This competency is based on the assumption that students are already familiar with the conventional search engines and are able to conduct basic searches. Therefore, it stresses the need to improve their planning of searches, using combined and interactive applications and sources of information, checking information and choosing the most relevant.

Students must find and select information using the criteria of relevancy, reliability and credibility. This selection must be accompanied by a critical process of transforming the information by taking into account its usefulness for the objectives and checking and adapting it to the language and level of the student while citing the sources and avoiding unsuitable appropriations and information plagiarism. In this sense, competencies 5 and 11 are closely related to this competency.

The data storage process is also part of this competency. By storage we mean content syndication, the creation of video or presentation channels, annotation tools, blogs, etc.

In the grading of the competency, we have considered search strategies (basic, advanced, dynamic), use of different applications and sources, and critical assessment and selection of the information found.

By basic search we mean the kind conducted using a key term or word through a search engine in both local networks and the Internet.

This kind of search becomes advanced when it requires further knowledge of search strategies, which may entail limiting the time bracket, geographic area, language, formats, etc., as well as the combination of

tools for different contexts and degrees of difficulty. That is, an advanced search means refining the search by specifying the parameters that limit its scope.

A dynamic search occurs in an automatic, programmed way by filtering information based on given criteria using specific tools (such as an RSS reader).

Here, by search context we mean the symbolic environment in which the search is conducted, such as a personal project to write a monograph, a group search for a school assignment, etc.

Attainment of this competency should empower students to conduct searches to resolve any questions they may have within the digital society.

#### Grading

- 4.1. Conducting basic searches, choosing relevant information considering different sources.
- 4.2. Conducting advanced searches. Critically evaluate the information found through different sources and select it adequately.
- 4.3. Conducting advanced and dynamic searches in different contexts, critically assessing the information found from different sources and properly choosing it.

#### Key contents

- Browser functionalities: Bookmarking, web history, printing, etc.
- Search engines: search types and methodology.
- Sources of digital information: Selection criteria and assessment.
- Selecting, sorting, storing and sharing information: Information tags, social bookmarkers, content curator, etc.
- Selective and dynamic information retrieval: Content syndication, readers and RSS publication, XML.
- Ethics and legal issues in the use and installation of programmes, communication systems, etc.

## Methodological guidelines

Searching for, selecting and capturing information is essentially a cross-curricular process that can be developed by both physical and virtual means. Any classroom situation that poses a question or issue to be resolved is a good way to activate this competency. However, its entire potential truly comes into play in interdisciplinary projects. The fact that these guidelines focus on digital aspects of the process does not mean that we should lose sight of the overarching scope of this capacity, since the ultimate goal is to get information in order to construct personal knowledge. Therefore, the guidelines proposed here can be put into practice in any curricular area.

When starting an online information search, teachers should:

- Ask students questions based on familiar situations and their interests related to the corresponding subject or area.
- Ensure that students identify their information needs and are capable of designing a search plan.
- Ensure that students plan their searches well considering the existence of search tools such as: directories, file repositories, online catalogues, meta-search engines, etc.
- Encourage diversification in the search so that students can locate, critically check and choose the information they have found, and promoting searches in different sources of information (digital encyclopaedias, digital newspapers and magazines, online publications, etc.) and in multiple search engines, as well as multilingual searches.
- Show students how to properly cite and reference the information found (URL, authorship, data found, subject, date updated, etc.).

In order to gradually develop this competency and conduct relevant, meaningful searches, teachers should encourage students to plan their searches. At first they should promote reflections which help students to plan, and later on the students will undertake these reflections independently.

Once the search has been planned, students are recommended to conduct several searches and to identify the best sources and tools for each. For example, if they have to search for information on a news story, teachers can suggest that they use television portals or videos as a source. In order to grasp the meaning of a mathematical or philosophical concept, perhaps they could check an online encyclopaedia in more than one language with the support of online translators, if needed.

These search strategies can be conducted at the first level using conventional search engines and referencing and storing the information. At the second level, students must conduct advanced searches. Conducting dynamic searches and classifying and categorising the results (categories and labels) come at the third level. However, at all levels students must consult a website and use more than one source to check the information.

Teachers should teach and encourage the use of social bookmarking, dynamic information readers following previously selected tags and other 2.0 applications. Later, each student should be capable of personalising and organizing the information they collect in their personal work and learning environment depending on their own interests (see competency 6).

In this competency, it is essential to provide students with competencies and strategies that will enable them to critically assess the information they find and to discriminate the most relevant information. The sample activity below seeks to show several possible strategies along these lines.

## Assessment guidelines

The result of the search can be evaluated any time an information gap exists, which could potentially occur in any of the curricular areas. Teachers should be aware of and record observations on how students access information, which tools they use and how they select and organize the information they find, and they should clearly distinguish these factors from the content found via the search, which should be evaluated in the corresponding subject area class.

Below are several indicators to assess the different levels of attainment of this competency:

Level 1	Level 2	Level 3
Defines an information need based on collective reflection.	Defines an information need based on shared reflection.	Defines an information need based on individual reflection.
Identifies key concepts or words based on collective reflection.	Identifies key concepts or words based on shared reflection.	Identifies key concepts or words based on individual reflection.
Develops a search plan and strategies with basic searches.	Develops a search plan and strategies which includes advanced searches.	Develops a search plan and strategies which includes dynamic searches.
With guidance, identifies, checks and chooses reliable sources of information with basic searches.	Identifies, checks and chooses reliable sources of information with basic and advanced searches.	Identifies, checks and chooses reliable sources of information with basic, advanced and dynamic searches.
With guidance, recognises the objectivity and authenticity of the information found in basic searches.	Recognises the objectivity and authenticity of the information found in basic and advanced searches.	Recognises the objectivity and authenticity of the information found in basic, advanced and dynamic searches.
With guidance, develops a specific product and references the sources.	Independently develops a specific product and references the sources.	Systematically develops a specific product and references the sources.
With guidance, shares the information found in a simple digital medium.	With guidance, shares the information found in various digital media.	Shares the information found in various digital media.
...	...	...



## COMPETENCY 5

### Constructing new personal information using information processing strategies with the support of digital applications

#### Description

This competency refers to understanding and cognitively processing information using digital devices and applications. The goal is to construct meaningful knowledge based on lessons learned and one's own ideas, as well as to solve real or realistic problems and interpret situations from everyday life.

Even though the information used to create new knowledge comes from a variety of sources, it can also be found on the Internet, so this competency entails continuing the intellectual work begun in competency 4.

Developing the competency means constructing and applying models or patterns through digital resources that help students to organize, understand, represent and communicate thoughts, arguments and conclusions while relating them to both the curricular contents and everyday life. These tasks can be performed both individually and collaboratively.

The acquisition of this competency entails the use of digital technology as an instrument of intellectual work, and it takes into account the digital complexity with which these intellectual skills are expressed and the student's expertise in using and adapting programmes to perform the assigned task.

For the grading of this competency, we have taken into account the range of digital devices, either generic or specific, and combinations of them to yield multi-mode productions.

Generic digital devices like word processors are distinguished from specific digital devices native to web 2.0. Generic digital devices are more versatile, and used more widely, even though they are not specialised for performing any given task; one example of this is creating a mindmap using a word processor.

Specific digital devices have features that allow for greater intentionality when performing specific tasks, such as a specific programme to create mindmaps.

Combining devices and applications corresponds to the third level of grading.

In this competency, by basic functions we mean the most common, simplest ones of each application, while by standard functions we mean the ones used the most widely in the different digital applications.

#### Grading

- 5.1. Organizing and constructing new knowledge using generic digital devices.
- 5.2. Organizing and constructing new knowledge using the basic options in specific digital devices.
- 5.3. Organizing and constructing new knowledge by combining different digital devices and using the standard options of specific devices.

#### Key contents

- Data storage and backup copies: stationary, removable and virtual.
- Robotics and programming: didactic robots, simulators, programming environments, automats, algorithms, etc.
- Virtual and augmented reality: video games, bookmarks, two-way codes, geolocation, etc.
- Editing tools for text documents, multimedia presentations and spreadsheets.
- Audiovisual language: still images, sound and video.
- Search engines: search types and methodology.
- Selecting, sorting, storing and sharing information.
- Ethics and legal issues in the use and installation of programmes, communication systems, etc.
- Information processing.
- Knowledge building: techniques and devices.
- Personal Learning Environment (PLE).
- Personal Learning Portfolios (digital portfolios).
- Lifelong learning: Personal Learning Environments. Resources for formal and non-formal learning in the Web.
- Digital identity visibility, reputation and management of one's own privacy as well as others.

## Methodological guidelines

Developing meaningful expressions of lessons learned and ideas is a cross-curricular process that takes place throughout all the areas of the curriculum. The fact that these representations are made using digital media facilitates their dissemination and the interaction among people regardless of space and time. As a result, the digital media offer an opportunity to create learning environments in which the instrument can more easily guide students and aid in the evolution of their learning.

In order to initiate students into the use of web 2.0 tools, instructors can provide them with tutorials or demonstrations which can be either teacher- or student-made, or they can draw from a wide variety of guides which can be found on the Internet.

Given that this competency is based on the creation of knowledge, instructors should keep an attitude that is open to dialogue and flexible towards different student expressions in order to guide them throughout the entire discovery process. We should underscore that the technical features of the majority of digital products facilitate procedures in which students can continually modify their productions whenever they wish to, and they thus encourage critical reflection of what students are developing.

When starting a project, the instructor should provide sufficient information on the product to be created; the digital resources, applications and tools that can help students to complete the assignment; the amount of time they should spend on it; and, in the case of group work, instructions on how the students should organize themselves.

As mentioned in the introduction, in the Knowledge Society, digitalisation brings major changes in the entire learning cycle, from searching for and processing information to generating new (personal) knowledge to transmitting this knowledge. Instructors should take into consideration the fact that knowledge is constructed based on interaction with one's environment, and thus digital applications also come into play as active agents in this interaction.

The features of how digital programmes operate require students to adjust and reformulate their knowledge and to enrich their cognitive process so that the result of the product is correct, regardless of whether these programmes are simulators (such as if the wrong units of data are entered in a film programme the movement will not be represented correctly) or feedback applications to be used with self-correcting suggestions (such as spellcheck).

Likewise, digital applications also provide a range of storage options (see competency 6), dissemination and publication options (see competency 7) for the knowledge that students are constructing throughout their school career, as well as for collaborative projects (see competency 8). The storage and publication possibilities, in turn, encourage revision, expansion, consultation, updating and further reformulations of this knowledge over time, as well as peer interaction.

The correct use of programmes, the possibilities for revision of the assigned tasks and peer interaction all come into play in creating new personal knowledge throughout one's life.

Below is a list of sample activities associated with this competency:

- Using underline tools in a word processor.
- Extracting meaningful parts of a text document, audio or video.
- Developing schemas using a simple word processor or a specific programme.
- Creating everything from basic to dynamic diagrams.
- Developing everything from the most classic presentations to more sophisticated ones, according to the programmes used.

- Creating mindmaps using basic vocabulary which can be filled out and modified as further information is added.
- Creating digital posters.
- Creating multimedia productions.
- Participating in publications with different kinds of discourses.
- Developing virtual maps and geolocation projects.
- Making timelines.
- Interpreting and generating databases.
- Interpreting and generating infographs.
- ...

## Assessment guidelines

This competency is evaluated based on the digital skills that students develop and apply students to construct knowledge in portfolios, presentations, publications, etc. Attainment of this competency is demonstrated in the more formal aspects of the end product with which students display their knowledge. The knowledge of the subject matter proposed in the activity should be evaluated using the criteria of the corresponding competency.

Below are several indicators on the attainment of the competency at the three levels established:

Level 1	Level 2	Level 3
To use a generic programme to perform tasks related to organizing, interpreting, assessing and creating knowledge.	To use a specific programme to perform tasks related to organizing, interpreting, assessing and creating knowledge using the elementary functions.	To use a specific programme to perform tasks related to organizing, interpreting, assessing and creating knowledge using the basic functions.
With guidance, to include different files in an original production in a linear fashion.	To independently include different files in an original production.	To independently include and manipulate different files in an original production.
With guidance, to include different formats to create simple hypertexts that show the relationships between different points.	To include different formats to create simple hypertexts that show the relationships between different points.	To include different formats to create dynamic hypertexts that show the intellectual skills related to creating knowledge.
With guidance, to use the most common online applications related to creating knowledge.	To use the most common online applications related to creating knowledge.	To use a variety of online applications related to displaying intellectual skills and creating knowledge.
With guidance, to use the most common online applications related to collaboratively creating knowledge.	To independently use the most common online applications related to collaboratively creating knowledge.	
...	...	...

The following activity is suggested to evaluate this competency:

To implement this competency, one example of an assessment activity is an online debate based on Martin Luther King's "I Have a Dream" speech. This activity can be assigned as an interdisciplinary task in Social Science, Geography and History, Foreign Languages and tutorial class.

If the school's foreign language is not English, the activity can be adapted. If the language is French, you can use General De Gaulle's BBC speech where he encourages the French Resistance on the 22<sup>nd</sup> of June 1940, following this link: <http://fresques.ina.fr/de-gaulle/fresque> [retrieved 26/10/2015]; or if the school's foreign language is German you can use the video of the speech by Willy Brandt on the 10<sup>th</sup> of November 1989 upon the fall of the Berlin Wall, [http://www.edu3.cat/Edu3tv/Fitxa?p\\_id=91165](http://www.edu3.cat/Edu3tv/Fitxa?p_id=91165) [retrieved 26/10/2015].

The students are given the following instructions:

**Using a digital tool, you must debate Martin Luther King's "I Have a Dream" speech. In order to do this, you will have to take part in a series of activities that will help you establish your point of view and start an active debate with your classmates in order to defend your position on the issue. Carry out the following activities:**

- 1) **Open a space in your personal learning portfolio** (see competency 6) **in order to share the following digital activities with your teachers:**
  - a) **Identify key words and create a digital mindmap relating the words to each other.**
  - b) **Map out the speech from a historical point of view (status of African-Americans at that time, other approaches to the civil rights movement such as Malcolm X's, the historical context of the 1960s...) by using a digital timeline.**
  - c) **Using a grid, analyse both verbal communication (speech organization and length, metaphors, images, etc.) and non-verbal communication (gestures, voice pitch, tone, expressiveness, pauses, etc.).**
- 2) **Participate in an online debate prompted by the following question: What is Martin Luther King referring to when he says: "I have a dream"? Defend your point of view using your work on the key words, the historical context in the timeline and the grid of the communicative elements.**
- 3) **Create a digital poster displaying your conclusions and showing the mindmap, timeline and grid you have created. Make any necessary changes raised from the debate. Post your digital poster in your class blog.**

The teacher should plan to use a tutorial on the more technical aspects of the different explanations for students who need it.

The following table of assessment criteria may be used to evaluate the activity:

Project name: Online debate on Martin Luther King's "I have a dream" speech		Student name:		
	Level 1	Level 2	Level 3	Assessment
Sharing a web environment	With guidance, sets up a web environment where they can share their assignments with their instructors and store them.	Independently sets up a web environment where they can share their assignments with their instructors and store them.		
Mindmap	Uses a generic text editing programme to organize and relate the keywords in a mindmap.	Uses a specific programme to organize and relate concepts and keywords in a mindmap and uses the elementary tools of the programme.	Uses a specific programme to organize and relate concepts and keywords in a mindmap and uses the basic tools of the programme.	
Timeline	Uses a generic text editing programme to draw the timeline where the historical framework is contextualised.	Uses a specific timeline programme to contextualise the historical framework using the elementary tools of the programme.	Uses a specific timeline programme to contextualise the historical framework using the basic tools of the programme.	
Communication grid	Uses a content grid template.	Designs a content grid using the elementary tools of the programme.	Designs a content grid using the basic tools of the programme.	
Participation in the debate	Participates in the debate with guidance.	Participates in the debate independently.		
Poster	Inserts and references previous documents in a generic document.	Independently inserts and references previous documents in an online digital poster using the elementary tools of the programme.	Inserts and references previous documents in an online digital poster using the basic tools of the programme.	

## COMPETENCY 6

### Organizing and using a personal work and learning environment with digital tools to perform in the knowledge society

#### Description

This competency refers to organizing personal learning environments which contain the applications, information sources, resources, time management strategies and communication tools used by each student, as well as their personal learning portfolio, which contains the documents that result from their intellectual output during the learning process.

This competency is grounded upon article 89.3 of the Law on Education of Catalonia (LEC), which defines the concepts of students' personal learning portfolio and digital portfolios as follows: "In accordance with the Department's provisions for this regulation, the personal learning portfolio digitally stores and makes accessible the documents and digital objects that result from each student's intellectual production during the learning process, from the last cycle of primary education until post-compulsory education. The content of the portfolio may be used as evidence in the assessment process."

Therefore, this competency is linked to planning the digital platforms, applications and resources that schools have outlined in their LKT, as well as the resources that the students use personally and the use of the personal learning portfolio starting in the second stage of primary education.

In addition to a personal learning portfolio where the student collects their productions, reflections, etc., and bearing in mind the range of digital sources of information, services, applications and connections available, students must organize one or several personal learning environments by the end of compulsory secondary education so that they can use them throughout their lives. The scope of this competency relates it to all the other digital competencies.

In this sense, this competency suggests a digital

space where two of the suppositions mentioned in the LEC as the guiding principles of the educational system take shape, namely lifelong learning and skills for continuous learning.

For the grading of this competency, we have regarded the degree of autonomy as the factor that determines students' learning levels when organizing their environment, along with the complexity of the applications used.

There is a clear need for this personal learning environment to be the place where the student's personal learning portfolio generated throughout their educational career is kept.

In this competency, by basic functions we mean the most common, simplest ones of each application, while by standard functions we mean the ones used the most widely in the different digital applications. By advanced search we mean the kind that allows the user to define the search parameters.

#### Grading

- 6.1.** With guidance, organizing and using a personal learning environment which includes the personal learning portfolio using basic search, creation and communication applications.
- 6.2.** Independently organizing and using a personal learning environment which includes the personal learning portfolio, using basic search and creation applications and, with the help of a tutorial, do communication exchange systems
- 6.3.** Organizing, using and independently setting up, using one's own criteria, a personal learning environment which includes the personal learning portfolio using advanced search applications and standard creation applications and communication exchange systems.

**Key contents**

- Editing tools for text documents, multimedia presentations and spreadsheets.
- Browser functionalities.
- Search engines: search types and methodology.
- Selecting, sorting, storing and sharing information.
- Ethics and legal issues in the use and installation of programmes, communication systems, etc.
- Knowledge building: techniques and devices.
- Personal Learning Environment (PLE).
- Personal Learning Portfolios (digital portfolios).
- Civic-mindedness and digital identity: procedures, management, leisure and culture.
- Lifelong learning: Personal Learning Environments. Resources for formal and non-formal learning in the Web.
- Digital identity visibility, reputation and management of one's own privacy as well as others.

**Methodological guidelines**

Throughout the different years of compulsory secondary education, instructors must encourage student autonomy so that students learn to organize their own personal learning space. This space should be included in the personal learning portfolio.

Instructors should tell students that digital files can be private, shared (with teachers or classmates) or public, and that factors that affect their own and others' digital identity come into play with shared and public files.

Personal learning environments should be a reflection of each student's needs, interests and organization, which means that it is unlikely for two environments to be the same. Despite this, a common structure can be established which could revolve around the following sections:

1. Search tools
2. Applications: for communication, creation, etc.
3. Generic work resources: dictionaries, calculator, applications to change file formats, periodic table, unit converters, GeoGebra, etc.
4. Time management
5. Addresses of interest
6. Personal learning portfolio

Attainment of this competency is closely linked to the LKT plan. This is a digital learning process that takes place throughout compulsory secondary education and binds together and gives coherence to the other digital competencies. Teachers in the different curricular areas must promote and help students to adopt, catalogue and organize digital information, materials and applications bearing in mind that resources can be cross-curricular and taking different, ever-changing personal needs into account.

The guidelines suggested below help to ensure that by the end of compulsory secondary education students will have organized their personal learning environment with differing degrees of autonomy.

- Planning a structure or structures for personal learning environments that reflect the student's storage needs.
- Encouraging familiarity with the potentialities of digital tools and the different personal environments where they can organize their work.
- Offering practice cataloguing and labelling tools and materials within digital environments.
- Promoting participation in collectively planning information management and organization strategies.
- Promoting activities to retrieve information and products.

- Encouraging neatness, transfers, reorganization, updates and fine-tuning of the different virtual learning spaces, when needed.
- ...

Tasks introducing students to the environments can be encouraged by proposing collaborative activities such as blogs, wikis, etc., so that students become familiar with these applications that they will later adopt themselves when they create their own environment. Likewise, seeing others' personal learning environments will foster critical analysis and consequently improvements in students' own environments.

The format of the personal learning environment can be as diverse as each student's needs and can range from simply developing a personal working and learning environment that combines the search, creation and intercommunication elements needed to use all the digital competencies in a simple, guided fashion to complex environments which include elements from different formats chosen independently using personal criteria.

Practical proposals with which to associate reflective activities are recommended to foster autonomy and the students' own criteria, as is sharing objectives between the instructor and student.

## **Assessment guidelines**

The assessment of this competency should consider the students' improvement as they build a personal learning system which they gradually add to with the goal of being autonomous and effective when meeting their needs for academic, personal and professional development. The assessment of this competency should be primarily formative and should encourage the student's own reflections and requirements.

To develop this competency, it is important to make an initial assessment at the beginning of the year in order to properly time, graduate and enrich the process, and to make another assessment at the end of the year to note the changes. Likewise, resolving practical cases which should reveal the utility or shortcomings of each student's personal learning environment is suggested as an assessment activity.

To evaluate the personal learning environment, schools must have instructors who are in charge of monitoring and evaluating this competency, bearing in mind the diversity of each student's personal needs. The intellectual output included in the personal learning portfolio should be evaluated by the instructor in the corresponding subject.

The relationship between this competency and the school's LKT plan should also be borne in mind, as mentioned above, along with the fact that the assessment of the personal learning environment can be enriched in two ways: by planning use strategies and to include new ones when deemed appropriate in the school's LKT plan.



Below are several indicators of attainment of this competency:

Level 1	Level 2	Level 3
With guidance, adopts a digital personal learning environment.	With guidance, configures their digital personal learning environment.	Configures their digital personal learning environment.
With guidance, organizes the personal learning environment.	Independently organizes the personal learning environment following selection guidelines.	Organizes the personal learning environment independently using their own criteria.
With guidance, saves and organizes their personal learning portfolio in the PLE along with basic search, communication and creation applications.	Independently saves and organizes their personal learning portfolio in the PLE along with basic search, communication and creation applications.	Saves and organizes their personal learning portfolio in the PLE with bookmarks and different resources and with basic search, communication and creation applications.
With guidance, updates their personal learning environment.	Independently updates their personal learning environment.	Independently updates their personal learning environment in an internally coherent way.
...	...	...

Below is a sample activity that could be used to evaluate the competency.

This activity allows the generic work resources in each student's Personal Learning Environment to be evaluated without forgetting the fact that it was designed according to their individual interests and needs.

**You have placed resources in your Personal Learning Environment (PLE), some of which can be used for different subject areas, as your instructors have told you: dictionaries, calculator, applications to change file formats, the periodic table, unit converters, etc.**

**Throughout your academic career, you have no doubt searched to find the resources that best meet your needs, bearing in mind that there are many that perform the same function.**

**In order to evaluate the resources you have chosen and share them with your classmates and colleagues, you are asked to design a grid where you can analyse them, describe their characteristics and explain why you chose them.**

**The grid should contain at least the following information:**

- **Name of the resource**
- **Brief description**
- **Justification for why you chose it**
- **Subject areas where it can be used**
- **Address**

**You must create an online digital document. The link to this document should be accessible in this class's common virtual space (you can use the tutorial, if needed). This digital document should show the organization of the resources in your personal learning environment.**

The instructor should ensure that there is a tutorial available to students who might need it that explains the more technical aspects of the different applications needed to complete this task.

The following table of assessment criteria is suggested to evaluate this activity:

Project name: Personal learning environment		Student name:		
	Level 1	Level 2	Level 3	Assessment
<b>Document: digital grid</b>	With guidance, opens a digital document where they make a grid of contents of the items mentioned in the assignment and shares it in a common virtual space.	Opens a digital document where they make a grid of contents of the items mentioned in the assignment and shares it in a common virtual space.	Opens a digital document where they make a grid of contents of the items mentioned in the assignment, shares it in a common virtual space and adds other items in addition to those mentioned in the assignment (such as a comparison of similar resources, etc.).	
<b>Choice of resource</b>	Chooses the resources following the instructor's directions.	Independently chooses the resources according to their usefulness.	Independently chooses the resources according to their usefulness after having checked different sources (forums, user communities, etc.).	
	The number of resources presented is the minimum stipulated by the instructor.	The number of resources presented is higher than the minimum stipulated by the instructor.		
<b>Analysis of resource using suitability criteria</b>	Analyses the suitability of the resource chosen by applying one criterion.	Analyses the suitability of the resource chosen by applying more than one criterion.	Analyses the suitability of the resource chosen by applying more than one criterion and explains its limitations in certain actions.	
<b>Organization within the environment</b>	With guidance, is capable of organizing the resources in their personal learning environment following the criteria used.	Is capable of independently organizing the resources in their personal learning environment following the criteria used.	Is capable of independently organizing the resources in their personal learning environment using their own criteria.	

## Interpersonal communication and collaboration dimension

This dimension, which includes two competencies, refers to the abilities to communicate and work collaboratively through local networks and the Internet by using publication and interpersonal communication tools and tools that facilitate engagement in collaborative projects (both in-person and remote).

The effective, efficient use of ICT to communicate, exchange and share different things both personally and academically makes it possible to create communities that work, learn and progress together. Knowing how to communicate, collaborate and choose the best media, channels and environments to accomplish goals is a process that students will gradually work towards until they acquire the autonomy they need to allow them to continue engaging in lifelong learning.

To this end, students must be capable of organizing and managing the communicative and collaborative environments in which they work, such as schools' educational platforms and the social media.

Attainment of this competency entails knowledge and effective and efficient use of digital communication media and collaborative programmes and websites, which will also help students to create and manage personal communication and learning environments that serve their own objectives and interests.

## COMPETENCY 7

### Participating in interpersonal communication environments and virtual publications to share information

#### Description

This competency refers to the selection and use of virtual interpersonal communication and publication tools bearing in mind that the purpose of the competency is to communicate, exchange, present and share personal, academic and professional information in a variety of communicative environments.

Students must be capable of ascertaining the codes and functioning of the most common digital communication and publication media and channels and to use them properly depending on the communicative purpose, the kind of information to be shared and the environment in which communication takes place.

To this end, this competency is closely related to the basic language competencies (available online at <http://www.gencat.cat/ensenyament>, in the Publications section within the “Core Competencies” section), since it refers to the digital aspect of what this document sets forth.

The scope of this competency is related to the digital communication systems used, whether or not the communication is simultaneous, the direction of the information flow, the scope of the communicative system, the communication channel and the kind of device used.

Regarding the digital communication systems used (email, messaging programmes, instant messaging, videoconferencing, etc.), these systems can be classified into specific systems for this purpose or systems integrated into more extensive collaborative environments with a different range of intentions: learning, work, free time, etc. (see competency 8).

However, whether or not the communication is in real-time should be borne in mind, that is, whether the issuer and recipient are present at the same time.

Digital systems have different directions of information flow that should be borne in mind depending on the communicative goal. This directionality can serve to connect (one-to-one), distribute (one-to-many) or collect (many-to-one), or it can be universal (many-to-many).

The scope of the communication system (public or private), the channel (oral, written and multimedia) and the device used (static or portable) should also be taken into account.

For the grading of the competency, we have considered the difficulty of the actions performed in personal communication and publication environments: communicating, publishing and managing communication systems. When gradating the competency also includes publication, suitability criteria also come into play, that is, the suitability of the language register used given the communicative situation.

#### Grading

- 7.1.** Communicating and publishing on the most common digital communication systems.
- 7.2.** Managing interpersonal communication systems in order to communicate and publish on them using suitability criteria.
- 7.3.** Organizing and managing interpersonal communication systems in order to communicate and publish on them using suitability criteria.

### Key contents

- Editing tools for text documents, multimedia presentations and spreadsheets.
- Audiovisual language: still images, sound and video.
- Ethics and legal issues in the use and installation of programmes, communication systems, etc.
- Information processing.
- Knowledge building: techniques and devices.
- Communication systems: e-mail, instant messaging, video conferencing, etc.
- Netiquette.
- Collaborative work and learning environments: Documents, wikis, blogs, VLEs, etc.
- Lifelong learning: Personal Learning Environments. Resources for formal and non-formal learning in the Web.
- Safe virtual environments: Safe websites, visibility of personal data, cybercrime (Phishing, etc.), malware.
- Digital identity visibility, reputation and management of one's own privacy as well as others.

### Methodological guidelines

To attain this competency, instructors should include the different digital communication systems as they cover the curriculum in their subject area so that students can learn them through real situations. Students should be given the opportunity to explore and develop a digital identity (see competency 11) that matches the characteristics of the different communicative settings and social media so that they learn about the different factors covered in the citizenship, habits, civic-mindedness and digital identity dimension.

On the other hand, instructors must harness the digital communication systems that students should use in their personal and non-academic lives and complete them, if needed, with others. That is, instructors should propose communicative situations bearing in mind the communicative system used, whether or not the user coincides in time with the other actors, the direction of the information flow, the public or private nature of the place where the communication takes place, the associated communication channel and the device used. For example, if the goal is to send a message to a single person, the user should determine whether instant messaging service or a chat is better, or perhaps a post on the social media, etc. What is more, the instructor should also inform the students about issues related to digital identity which stems from their conscious or unconscious presence online.

We cannot forget the importance of more clearly linguistic aspects, such as adjusting the codes, registers or communicative rules to each system, such as precision and brevity in the subject line of an email, rules for inserting links into conversation threads, etc. It is the instructor's job to help students in this process by presenting models that fit the different personal or professional communication purposes, as well as the recipients to whom they are addressing: family, professional, academic or institutional. In this sense, this competency is closely related to the basic language competencies.

Instructors have to encourage students to join and create communities and interactive networks aligned with their social, cultural and educational needs and to include them in their personal work and learning environment. The goal is for students to be familiar with the possibility of creating their own social media groups, following the accounts of others who interest them or subscribing to online publications.

It is important to stress that the inclusion of interpersonal digital communication tools into everyday classroom practice will both facilitate and expand students' knowledge in any of the curricular subjects through activities, some of which are listed below:

- Using email to deliver assignments, work portfolios, projects, requests and exchanges.
- Using forums to discuss the news, solve puzzles, ask questions, follow up on research projects.
- Using digital calendars to organize the timing of collaborative projects and turn in assignments, projects, exams, homework, etc.

- Using shared documents to collaboratively develop documents.
- Using social media and microblogging platforms to comment on oral presentations, lectures, projects, etc.
- Publishing online photo albums on the topics of collaborative projects or sharing them with the rest of the class.
- Publishing online videos recorded while carrying out activities.
- Creating and publishing digital posters that contain images, videos and sound files to illustrate a topic.
- Creating, monitoring and participating in blogs with comments.
- ...

## Assessment guidelines

This competency should be evaluated based on activities or projects in any area of knowledge, given that any area can incorporate the use of these interpersonal communication or publication systems for consultation, collaboration or dissemination.

The assessment of this competency should focus on the student's use of the communication system chosen bearing in mind the message, the recipients and the codes, registers and rules of the system, the device and the suitability of the means of publication, which should be disassociated with the specific content of the communication or publication.

Below are several indicators of the attainment of the competency at the three levels established:

Level 1	Level 2	Level 3
Uses email to send, answer and forward emails, attaches files for deferred communication and chooses the field with a copy (CC) or blind copy (BCC).	Uses email to send, answer and forward emails, attaches files, labels and organizes the emails into folders for deferred communication and chooses the field with a copy (CC) or blind copy (BCC).	Uses email to send, answer and forward emails, attaches files, labels and organizes the emails into folders for deferred communication, chooses the field with a copy (CC) or blind copy (BCC) and uses associated services like alerts and content syndication.
Uses instant messaging services (chats, mobile messages, etc.) to communicate in real time.	Manages instant messaging services (chats, mobile messages, etc.) to communicate in real time.	
Uses shared digital documents along with their integrated communication tools with guidance.	Uses shared digital documents along with their integrated communication tools.	Uses shared digital documents while managing their integrated communication tools.
Participates in web spaces (blogs, forums, job exchanges, etc.).	Creates and posts different files in a web space (blogs, forums, job exchanges, etc.) and comments in spaces created by others.	Creates and posts different files in a web space (blogs, forums, job exchanges, etc.), relates them to other spaces they have created themselves and comments in spaces created by others.
With guidance, identifies and uses the right digital channel and code for the purpose of the communication.	Identifies and uses the right digital channel and code for the purpose of the communication.	Identifies, chooses and uses sound criteria to use the right digital channel and code for the purpose of the communication.
With guidance, participates and manages their digital identity in an interactive network.	Participates and manages their digital identity in an interactive network.	Manages their digital identity in an interactive network and creates and manages groups there.
...	...	...

## COMPETENCY 8

### Engaging in group activities using virtual collaborative work tools and environments

#### Description

This competency refers to the use of virtual tools and environments that support collaborative activities, including wikis, shared documents, training platforms, networks, etc., and it focuses on students' need to know how to use the potentialities afforded by virtual environments in their classroom work for assignments and collaborative learning.

One of the properties of VLEs is that they allow multiple online applications to be used, which facilitate group activities: the shared creation of documents, images, videos, etc.; belonging to debate groups to exchange ideas; offering or receiving help; collaborating on projects, etc. The relationship with the other competencies is clear, since the possibility of using collaborative tools and environments is expanding in parallel to the use of the Internet and with the implementation of tools associated with the majority of computer programmes.

The development of collaborative projects with the support of these virtual online tools allows the barriers of space and time to be overcome with real-time and deferred tools. They also facilitate information searches, information processing, editing and the dissemination of personal or group contents, along with the possibility of maintaining communication in both the academic and social settings.

The acquisition of the competency entails the use of a range of possibilities involving collaborative work and learning environments with either open or restricted access, collaborations managed by an administrator or horizontal management (where all the group members have editing rights) and shared communication tools, such as mail, forums, debates, role games, videoconferencing, etc...

For the grading of the competency, we have considered the student's degree of autonomy in participating, developing, managing and using the collaborative functions of VLEs and their capacity to manage them, with creating, actively participating, publishing and

even promoting groups through personal interests in learning environments as the top level of attainment.

In this competency, by basic functions we mean the most common, simplest ones of each application, while by standard functions we mean the ones used the most widely in the different digital applications

#### Grading

- 8.1.** Participating in collaborative activities in virtual environments using basic functionalities.
- 8.2.** Participating in and developing collaborative activities while choosing the most suitable basic tools for each case.
- 8.3.** Participating in, developing, organizing and managing a collaborative work environment and to carry out collaborative activities there.

#### Key contents

- Robotics and programming.
- Editing tools for text documents, multimedia presentations and spreadsheets.
- Ethics and legal issues in the use and installation of programmes, communication systems, etc.
- Knowledge building: techniques and devices.
- Communication systems: e-mail, instant messaging, video conferencing, etc.
- Netiquette.
- Collaborative work and learning environments: Documents, wikis, blogs, VLEs, etc.
- Lifelong learning: Personal Learning Environments. Resources for formal and non-formal learning in the Web.
- Safe virtual environments: Safe websites, visibility of personal data, cybercrime (Phishing, etc.), malware.
- Digital identity visibility, reputation and management of one's own privacy as well as others.

## Methodological guidelines

One of the most noteworthy characteristics of working digitally which justifies a methodology involving group work and peer learning is the ease of using collaborative work tools and environments. Having the instructor suggest group work can have a positive influence on both the students' appropriation of the curricular objectives and the social objectives of interaction, inclusion, peaceful coexistence and knowledge of oneself and others.

Collaborative work necessarily implies interpersonal communication. In digital environments, this communication can take place through specific interpersonal communication applications disassociated from these environments (email, chats, forums, etc.) or through applications that are integrated into the environment itself. In the classroom, the instructor must allow and encourage the use of these communication applications and take advantage of students' knowledge of them so that they can resolve both technical issues and aspects related to communication – introduction and farewell protocols, respect, security, choice of the best tool depending on the communicative purpose, etc. – in the context of learning (see competency 7).

The close relationship between competency 8 and the other digital competencies and all the curricular subjects enhances a global approach and interdisciplinary and disciplinary projects because the use of digital environments helps bind them all together.

Even though the instructors in the different curricular subjects should encourage students to use collaborative learning and communication tools and environments by suggesting activities that entail cooperative and collaborative tasks, when assigning this type of task it is important to consider issues related to group dynamics in order to ensure listening skills and respect for others when working both inside the classroom and remotely.

In this sense, instructors must ensure that all students understand the objectives of the task, the means available to complete it, the result expected of both the group and each individual student, etc.

In collaborative practices, the instructor should take a constructive attitude to determine whether or not they should intervene at the different stages in the process depending on the objectives of the assignment.

It should be borne in mind that when using interpersonal communication tools, the interventions of the different group members can be retrieved whenever wanted throughout the entire learning process (and real-time digital genres like chats, videoconferences and role plays can be configured to store interactions, if that is not the default setting).

The instructor should also inform the students about issues related to the digital identity which stem from their conscious or unconscious presence online (see competency 11).

Below is a description of possible activities:

- Planning group work using collaborative tools for text editing, multimedia presentations, processing numerical data and graphic representations.
- Suggesting that students make collaborative multimedia productions.
- Proposing digital information quests to share sources and results with the goal of enriching the comparison and selection of this information.
- Encouraging group work when processing information using digital devices in order to construct new knowledge based on schemes, diagrams, presentations, mindmaps, timelines, digital posters, virtual maps, etc.
- Proposing that students manage a virtual collaborative work space.
- Encouraging participation in forums, chats, videoconferences, etc.
- Proposing that students make group publications.
- Establishing peer assessment systems.
- ...



## Assessment guidelines

This competency is evaluated based on student projects. It is a good idea to set assessment milestones for different group members' effort and participation throughout the process which allows undesirable dynamics to be rechanneled or learning to be regulated through formative assessment. It also allows the instructor to gather information in order to make a personal judgement on the students' level of mastery of the competency at the end of the period.

It should be borne in mind that it is easy to individually track the interventions of the different group members because their interventions are recorded in many collaborative tools. Group assessment items must be included in assignments where group work is one of the objectives.

Below are several indicators of the attainment of the competency at the three levels established:

Level 1	Level 2	Level 3
With guidance, identifies the programmes needed to perform the collaborative tasks.	Identifies the programmes needed to perform tasks related to the collaborative work.	Identifies and combines, if needed, the programmes needed to perform tasks related to the collaborative work.
Is familiar with and applies the courtesy protocols and registers of collaborative applications with guidance.	Is familiar with and applies the courtesy protocols and registers of collaborative applications.	Is familiar with and applies the courtesy protocols and registers of collaborative applications and recognises inappropriate uses.
With guidance, uses the most appropriate basic computer programme functions to perform tasks related to collaborative work.	Uses the most appropriate computer programme functions to perform tasks related to collaborative work.	Uses and configures most of the most appropriate computer programme functions to perform tasks related to collaborative work.
With guidance, participates in the debate while respecting the different conversation threads.	Easily participates in the debate while respecting the different conversation threads.	Participates easily in the debate while respecting the different conversation threads and opening new ones, when needed.
With guidance, includes a variety of multimedia files in the shared project.	Includes a variety of multimedia files in a shared production to generate simple hypertexts.	Is capable of making multimode creations collaboratively and managing their publication in a group along with a feedback system with the environment, if needed.
...	...	...

# Citizenship, habits, civic-mindedness and digital identity dimension

This dimension is made up of three competencies and can be regarded as a cross-curricular dimension which is encompassed in the other three dimensions, the other competencies and all the curricular areas in this stage of education. Not all the competencies in this dimension are gradated. Competency 9 has been gradated because it is assumed that upon completion of this stage of education, students will have enough knowledge to participate in citizen actions, and this factor can indeed be gradated. However, we deemed that competencies 10 and 11, which deal with attitudinal considerations, were best left without grading.

The purpose of this dimension is to prepare students so that by the time they complete compulsory secondary education they are citizens who know how to competently, responsibly use digital resources, are respectful of the laws in force and intellectual property, and at the same time use the proper measures to ensure the security of their own digital identity. This competency also strives to ensure that they have enough resources to continue their lifelong learning and participate in the actions that society offers them as citizens.

Regarding the assessment of the multiple kinds of contents and resources available online, by the end of their schooling students should have enough resources to critically assess them, determine their suitability for their intentions in each situation and, when using them, act as participative citizens who are integrated into their environment.

On the other hand, healthy ICT habits encompass aspects related to both free-time situations and interpersonal communications and issues related to ergonomics, sight, hearing, etc.

Finally, it is important to consider that the boundary between the use and abuse of mobile telephones, games, messaging, Internet browsing and the social media is very fragile, and that it can actually negatively affect the individual and those around them physically, psychologically and socially. To ensure a healthy use of technology, students must be informed about the risks as well as the existence of protocols to prevent addiction prompted by the abusive use of technology. Students should also be made aware of how to act, for example, when faced with behaviours that use the Internet for cyberbullying, which must be reported because it is illegal, and they must know what they need to do in order to report it.

## COMPETENCY 9

### Engaging in citizenship and personal development activities using the digital resources common in today's society

#### Description

This competency refers to digital citizenship actions that students should know how to do in order to integrate into society, and it promotes the personal skills that they have developed throughout all the other competencies to resolve administrative, commercial, educational and other electronic situations.

In this sense, the corresponding activities are closely related to competency 4 (Seeking, checking and choosing appropriate digital information for the task being performed, considering different sources and digital media), competency 7 (Participating in interpersonal communication environments and virtual publications to share information) and competency 11 (Acting critically and responsibly when using ICT considering factors such as ethics, laws, safety, sustainability and digital identity). What this new competency adds is the purpose for which the search, communication and secure actions are being done safely.

It is increasingly common to perform procedures and engage services on the Internet (shopping, working, lifelong learning, culture and free-time activities), which means that students have to develop the ability to assess the most efficient communication system for these actions and know how to act in digital environments in order to satisfactorily meet their needs.

For the grading of this competency, we have considered the kind of actions and the complexity of navigating the portal where they are performed, along with the tracking of the information.

At the first level, we have taken into account digital procedures which are used by most citizens and are associated with portals where the internal navigation is linear.

At the second level, we have considered common actions including portals that require a chain of navigation based on simple choices offered in the same environment.

And finally, at the third level we have included any kind of procedure in any kind of portal, regardless of how difficult it might be, even in the handling of chains of actions based on decisions that require additional information.

#### Grading

- 9.1. Performing digital procedures using linear navigation which requires simple actions, tracking the information directly and being aware of issues related to digital identity.
- 9.2. Performing digital procedures using chains of navigation based on simple actions, automatically tracking the information and being aware of issues related to digital identity.
- 9.3. Performing all kinds of digital procedures and using a variety of Internet services to automate the management and track the information.

#### Key contents

- Search engines: search types and methodology.
- Sources of digital information: Selection criteria and assessment.
- Ethics and legal issues in the use and installation of programmes, communication systems, etc.
- Communication systems: e-mail, instant messaging, video conferencing, etc.
- Netiquette.
- Civic-mindedness and digital identity: procedures, management, leisure and culture. Electronic administration, commercial webpages, specialized websites, culture channels, social networks, online games, content syndication.
- Lifelong learning: Personal Learning Environments. Resources for formal and non-formal learning in the Web.
- Safe virtual environments: Safe websites, visibility of personal data, cybercrime (Phishing, etc.), malware.
- Digital identity visibility, reputation and management of one's own privacy as well as others.

## Methodological guidelines

The activities related to this competency should have two characteristics: first, they should simulate situations similar to the ones found in everyday life outside the school, and secondly, they should provide information and encourage reflection on the best way to manage digital citizenship.

Prior to any activity or assignment, instructors should outline and discuss with the entire class the guidelines that students should bear in mind when a web portal asks them to register in order to access the information or services requested, along with the advantages and disadvantages of syndications to distribution lists, which institutional websites are considered the most necessary for accessing the government offices, and other issues.

Either disciplinary or interdisciplinary projects which put more than one digital competency into practice can be used for this purpose, as well as specific activities in which students have to conduct simulations in which they solve practical problems from everyday life.

Some activities that might form part of projects from any subject area include:

- Visiting different sites in which students can experience lifelong learning, both formal and informal: distance education centres, universities, thematic websites, social media, etc. to see the site and the possibilities it offers.
- In small groups, analysing the data that can be omitted when registering (creating a profile) depending on the site: town hall, library, friends, learning site, transport company, turning in one's CV, etc.
- Simulating shopping for a variety of services and items: transport ticket, books, music, etc.
- Filing complaints or submitting suggestions to an official body on a given topic: Department of Education, town hall, hospital, etc.
- Registering and removing one's registration for news and updates from the press and thematic websites.
- ...

## Assessment guidelines

The competency should be evaluated based on simulations of activities closely related to everyday life which students will have to perform as citizens in a digitalised society.

Below are several indicators of the attainment of the competency at the three levels established:

Level 1	Level 2	Level 3
Performs digital procedures using linear navigation where simple actions are required.	Performs digital procedures using chained navigation based on simple options all offered on the same site.	Performs digital procedures using chained navigation even on portals where additional information is needed.
Identifies the different kinds of data being requested by service websites in order to get the information they want, and only offers secure information.		
Knows how to get relevant information for their personal procedures on service sites.	Knows how to get relevant information for their personal procedures on service sites and follows up on it.	
Follows the news in the media with direct actions.	Follows the news in the media with automated actions.	Follows, manages and stores, if desired, the news in the media with automated actions.
Knows how to make payments via the Internet while checking the security conditions, if needed.		
...	...	...

Below is an example of an activity to evaluate the competency:

**Taking advantage of the fact that students in their fourth year of secondary education take an end-of-year trip, in the tutorials, social sciences, natural sciences and mathematics classes they can be asked to suggest a European destination city bearing different factors in mind.**

**In order to decide on the destination of the end-of-year trip, you have to search for information that will help you to choose a city, bearing in mind the cost, feasibility and interest of the choice. You have to present your proposal to your classmates with the help of a presentation tool with the appropriate links and screenshots. Your presentation must include:**

**1. Proposal of the city and total travel cost.**

**2. Explanation of the trip and total cost indicating:**

- **Round-trip transportation**
- **Housing**
- **Itinerary on an interactive map showing the proposed route and the transport used**
- **Visits to touristic sites**

**3. Information on aid (student card, youth hostel membership, etc.).**

The following table of assessment criteria can be used to evaluate this activity:

Project name: Trip around Europe		Student name:		
	Level 1	Level 2	Level 3	Assessment
Location of websites	Locates the portal independently with a basic search and with guidance if they require an advanced or dynamic search.	Locates the management portal independently with a basic and advanced search, and with guidance if they require a dynamic search.	Locates the management portal independently with a basic, advanced or dynamic search.	
Identification of the information	Identifies the different kind of data requested by service websites to get the information they want and only offers this information to secure websites (and takes a screenshot for the assessment of the activity).			
Consultation in travellers' forums and social media	Exchanges information online, offering only the information needed to perform the task.	Exchanges information on social media and thematic websites and joins them to get updated information in order to perform the task.	Exchanges information on social media and thematic websites, joins them to get updated information and knows how to effectively register and terminate registration.	
Number of consultations	The student screenshots a single screen for each decision.	The student screenshots two screens for each decision.	The student makes several screenshots that allow for a more in-depth analysis of the information.	

The appropriateness of the economic calculations can be evaluated in the Mathematics class and the reflection on the choice of cultural sites or natural spaces can be evaluated in Social Science or Natural Science classes, respectively.

## COMPETENCY 10

### Fostering healthy ICT habits linked to ergonomics to prevent health risks

#### Description

This competency deals with the actions that can be done at schools to promote healthy ergonomic and ICT habits based on informative and reflective tasks. According to the Dictionary of the Catalan Language put out by the Institute of Catalan Studies, ergonomics means the “science that examines the adaptation of work to the physical and psychological conditions of humans so that the person-machine binomial becomes as effective as possible”.

Knowledge of the potential physical and psychological injuries that could be caused from continuous work is part of risk prevention in every profession, including work with digital devices. Given that students are intensive users of these devices, both inside and outside the classroom, schools must provide them with the information they need to prevent harmful effects.

On the other hand, it is also important to be aware of risky situations from the standpoint of behaviours

associated with the use of technologies. Fostering a critical attitude in this sense should contribute to preventing behaviour problems and addictions. To this end, students should be made aware of action plans and public and private entities where they can seek help and support if needed.

The Department of Education provides information to everyone on the use and abuse of technologies through its Family and School portal (<http://familiaiescola.gencat.cat/ca/educar-creixer-en-familia/educacio-us-tecnologies/>).

#### Key contents

- Search engines: search types and methodology.
- Civic-mindedness and digital identity: procedures, management, leisure and culture.
- Lifelong learning: Personal Learning Environments. Resources for formal and non-formal learning in the Web.
- Ergonomics - Physical and mental health.

## Methodological guidelines

To implement this competency, instructors must explain the risks posed by certain uses of devices, digital environments, applications and communication systems. To this end, they can suggest information quests and observations aimed at encouraging self-reflection and self-analysis.

It is important to stress that it is the job of all instructors to ensure a reasonable use of the work environment inside the classroom and that observation of improper use may be associated with detecting some kind of physical or psychological difficulty that should be referred to the appropriate professional.

To share sound ergonomic practices related to digital work, the instructor must not only provide students with information but also offer opportunities for reflection which foster critical thinking and the adoption of personal criteria while encouraging dialogue, avoiding a simplistic approach.

On the other hand, regarding the issue of addictions, instructors should frame them accurately, since there are not so many new addictions added to the already existing ones but new expressions of addictive behaviours that already existed before.

It should be pointed out that the new technologies are not dangerous in themselves, but, as seen throughout the entire document, they are in fact highly useful and beneficial for getting information immediately, developing knowledge and communicating interpersonally, and yet certain risky situations might arise that fall outside their voluntary control and lead to a state of dependence.

Likewise, it is important to offer opportunities for joint reflection on the possible risks entailed by sharing personal information on the Internet. A series of activities is proposed to achieve this end:

- Designing and generating graphic materials that illustrate good ergonomic practices, including body position when using different devices, visual and auditory health, and the prevention of possible addictive practices. These materials could be displayed in a physical or virtual classroom space.
- Finding websites on the Internet that could be used as references and to post them on the school's blog or website.
- In small groups, writing a collaborative document in the guise of an article on some aspect of the competency and share it with classmates.
- Making videos or presentations on social addictions related to the difficulty of establishing clear boundaries between the use and abuse of technology based on existing models found on reference websites.
- Reading and commenting on articles by prominent figures that discuss the topics of this competency in order to debate them.
- Making a multimedia presentation on a topic related to this competency and later holding a debate in-person or via a forum related to this topic.
- ...

## Assessment guidelines

The fact that this competency describes recommended behaviours in terms of ergonomics, and the fact that these behaviours continue when students are not in the classroom, means that they should be given resources that enable them to become aware of their habits.

Reflective activities to encourage recommendable habits should be suggested.



## COMPETENCY 11

### Acting critically and responsibly when using ICT considering factors such as ethics, laws, safety, sustainability and digital identity

#### Description

This competency refers to the need to reflect on and be aware of the implications of the habitual use of technology and the Internet in terms of legal issues, security, sustainability and digital identity issues. In this sense, this competency is related to all the others because of its civic content, and it is also associated with lifelong learning.

Assessing the contents that users share on the web from the ethical standpoint should be a cause of reflection in order to avoid possible offense, discrimination and apologies for ideologies which are considered ethically reprehensible, regardless of whether they refer to entities, collectives and physical persons. Likewise, regarding legal issues, the licenses that protect the copyright of one's own productions and those of third parties must be borne in mind, and therefore users must have an idea of the laws in force on digital productions.

Regarding aspects related to digital security, users should be aware of the possible manipulation of devices connected to the web, such as digital attacks, data appropriation, viral replications, etc.

Regarding sustainability and the generation of digital waste, the consequences of both productions that are suspended and those that squander resources such as online space, unnecessary energy consumption, oversized devices, etc., as well as physical waste such as devices or consumables which are replaced by newer ones (computers, ink, toner, paper, etc.), are also covered in this competency.

Most of these issues also affect the more personal realm associated with our presence as users of the Internet which shapes our digital identity. By digital identity we mean the identity generated based on our online presence. Therefore, this competency also deals with effectively managing our visibility, reputation and privacy based on the actions we carry out on the Internet. It should be borne in mind that the most

effective way to manage digital identity is for students to be aware and participate in web environments.

On the other hand, the issues dealt with in this competency are not fundamentally different to the ethical, legal, security, sustainability and identity considerations in the universal principles regulating human behaviour, although it is worth bearing mind that new, more globalised scenarios are appearing which offer a false perception of anonymity.

#### Key contents

- Data storage and backup copies: stationary, removable and virtual.
- Basic contents of operating systems.
- Editing tools for text documents, multimedia presentations and spreadsheets.
- Search engines: search types and methodology.
- Sources of digital information: Selection criteria and assessment.
- Ethics and legal issues in the use and installation of programmes, communication systems, etc.
- Communication systems: e-mail, instant messaging, video conferencing, etc.
- Netiquette.
- Collaborative work and learning environments: Documents, wikis, blogs, VLEs, etc.
- Civic-mindedness and digital identity: procedures, management, leisure and culture.
- Lifelong learning: Personal Learning Environments. Resources for formal and non-formal learning in the Web.
- Safe virtual environments: Safe websites, visibility of personal data, cybercrime (Phishing, etc.), malware.
- Sustainability: Energy use, printing expenses, saving measures, device substitution, etc.
- Digital identity visibility, reputation and management of one's own privacy as well as others.

## Methodological guidelines

The classroom activities to attain this competency pose the need to interrelate them with all the other digital competencies given that when using technology, and all other human activities, we must bear in mind habits and attitudes referring to ethics, legal issues, security and sustainability. Likewise, all the activities we perform online shape our digital identity.

To attain this competency, instructors can set up simulations in which students have to solve real problems from everyday life. Observing real cases, while avoiding alarming viewpoints, is a good way to work on more reflective activities.

To examine topics related to ethics and security, students may use materials from the World Intellectual Property Organization (<http://www.wipo.int>), among others.

Regarding digital identity, instructors can encourage debates and reflections in the classroom aimed at raising students' awareness of visibility, reputation and managing the privacy of their data, bearing in mind that any given digital identity may or may not reflect a person's real identity.

Visibility on the Internet corresponds to our knowledge of a person. This knowledge is gradually shaped not only by the profiles that the user manages but also by their participation in digital spaces: publishing blogs, comments on social media, videos, photograph, etc., and by the way that these may be spread by third persons.

It is important for the instructor to help interpret how the personal visibility on the Internet builds reputation, which is related to value judgements bearing in mind who is speaking, about whom, where and how, and to assess which actions foster positive and/or negative judgements. It would be a good idea to suggest case studies in which we examine others' opinions in order to determine their reputation.

The topic of managing the privacy of one's information on the Internet requires special attention, primarily because of the widespread use of the social media, where users expose their information voluntarily. Instructors should also encourage awareness-raising initiatives aimed at fostering reflection on data protection when filling out forms, etc. The Catalan Data Protection Authority (APDCAT) has a space targeted at young people where they can find information on this issue and resources for examining it in the classroom (<http://www.apd.cat>).

Below are several examples of activities aimed at acquiring this competency:

- Getting to know and sharing spaces with resources (images, sounds, etc.) under different kinds of licenses.
- Downloading and installing applications legally, clearly determining those that can be used freely.
- Searching for information online on authorship licenses and discussing it with the entire group.
- Comparing different websites in order to detect the elements that reveal their credibility and security (see competency 4).
- Analysing the strategies that different portals, servers, etc. use in order to bring advertising to users: emerging windows, banners, consented advertising, personalised advertising (see competency 4).
- Reflecting on the specific netiquette for email, chats and forums, etc. (see competency 7).
- Getting to know and sharing strategies to recognise our visibility and reputation on the Internet, such as using search engines for this purpose.
- In small groups, analysing the information that must be provided or can be omitted when registering (making a profile) in different environments: town hall, library, friends, learning space, transport company, turning in one's CV, etc. (see competency 7).
- Simulating purchasing different services or objects: transport tickets, books, music, etc. (see competency 9).
- ...

## Assessment guidelines

Attainment of this competency can be evaluated by specific activities or, in fact, any activity which has to take ethical, legal, security, sustainability or digital identity factors into account, and which therefore can provide assessment indicators. In this sense, it is wise to ensure fulfilment of the aspects dealt with here in any activity that could possibly include them, and therefore they could be counted in any assessment activity.

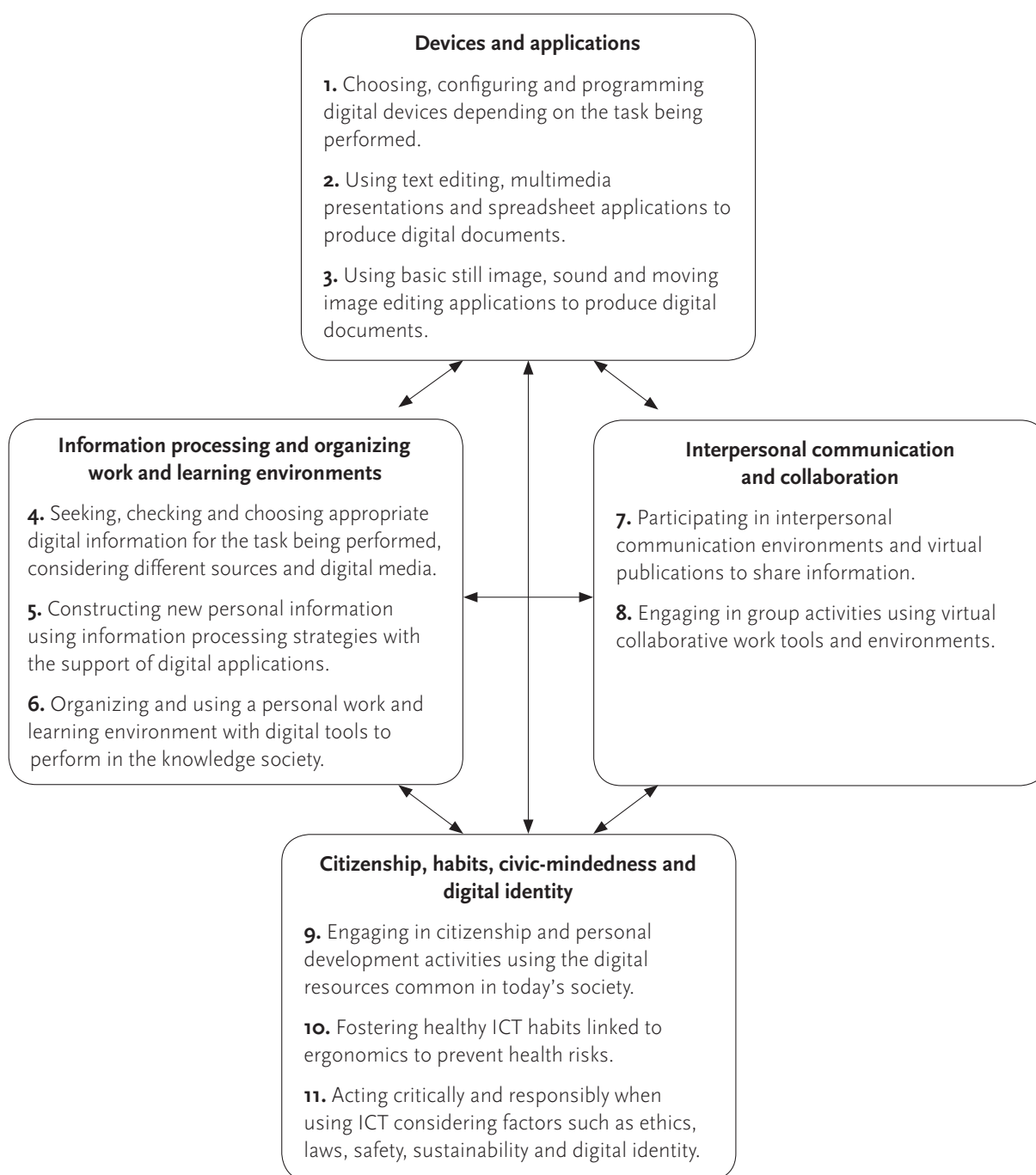
Precise indicators should be provided to ensure that attainment of this competency is clear; to detect whether the students are aware of the ethical, legal, security, sustainability and digital identity issues; and to check whether they act accordingly.

Below are several examples of indicators to evaluate this competency in a table of assessment criteria.

	Items	Observations
<b>Legal issues</b>	Uses and knows about authorship licenses.	
<b>Sustainability</b>	Bears in mind the repercussions of their actions in terms of digital sustainability and planning effective solutions.	
<b>Security</b>	Strategies to preserve identity (use of avatars, managing of different email accounts, accepting friends, etc.).	
	Uses security systems and techniques (deleting email, protecting the computer with a firewall, anti-spyware and anti-viruses, etc.).	
<b>Digital identity</b>	Manages their own digital identity.	
	Is aware of strategies to identify one's own or others' identities.	

# Annexe 1

## Illustration of the relationships among the dimensions



## Annexe 2

### Key contents of the competencies

Continguts clau	Competències											
	1	2	3	4	5	6	7	8	9	10	11	
1. Basic functionalities of devices												
2. Types of connections between devices												
3. Data storage and safety copies												
4. Basic concepts of operating systems												
5. Computer security												
6. Robotics and programming												
7. Virtual and augmented reality												
8. Projection systems												
9. Editing tools for text documents, multimedia presentations and spreadsheets												
10. Audiovisual language: still image, sound and video												
11. Browser functionalities												
12. Search engines: search types and methodology												
13. Sources of digital information: Selection criteria and assessment												
14. Selecting, sorting, storing and sharing information												
15. Ethics and legal issues in the use and installation of programmes, communication systems, etc.												
16. Information processing												
17. Knowledge building: techniques and devices												
18. Personal learning environment (PLE)												
19. Personal learning portfolios (digital portfolios)												
20. Communication systems												
21. Netiquette												
22. Collaborative work and learning environments												
23. Civic-mindedness and digital identity: procedures, management, leisure and culture												
24. Lifelong learning: Personal Learning Environments. Resources for formal and non-formal learning in the Web												
25. Ergonomics - Physical and mental health												
26. Safe virtual environments												
27. Sustainability: Energy use, printing expenses, saving measures, device substitution, etc.												
28. Digital identity visibility, reputation and privacy												

# Annexe 3

## Competencies and graded levels

	Competencies	Level 1	Level 2	Level 3
Devices and applications dimension	<b>1. Choosing, configuring and programming digital devices depending on the task being performed.</b>	<b>1.1.</b> Choosing digital devices and using their basic functionalities depending on the task to be performed.	<b>1.2.</b> Choosing and determining the settings of digital devices and to use their basic functionalities.	<b>1.3.</b> Choosing, determining the settings and programming digital work environments while considering interconnectivity and security factors.
	<b>2. Using text editing, multimedia presentations and spreadsheet applications to produce digital documents.</b>	<b>2.1.</b> Developing documents using the most basic text editing, multimedia presentations, numerical processing and graphic representation functions.	<b>2.2.</b> Developing documents using the standard text editing, multimedia presentations, numerical processing and graphic representation functions.	<b>2.3.</b> Developing complex documents using standard functions and other functions depending on needs.
	<b>3. Using basic still image, sound and moving image editing applications to produce digital documents.</b>	<b>3.1.</b> Making simple multimedia productions based on one's own or others' materials, applying the basic functions of editing programmes.	<b>3.2.</b> Making multimedia productions based on one's own or others' materials, applying the basic functions of editing programmes.	<b>3.3.</b> Making multimedia productions based on one's own or others' materials which combine a variety of audiovisual materials, applying the standard functions of editing programmes.

	Competencies	Level 1	Level 2	Level 3
Information processing and organizing work and learning environments dimension	<b>4. Seeking, checking and choosing appropriate digital information for the task being performed, considering different sources and digital media.</b>	<b>4.1.</b> Conducting basic searches, choosing relevant information considering different sources.	<b>4.2.</b> Conducting advanced searches. Critically evaluate the information found through different sources and select it adequately.	<b>4.3.</b> Conducting advanced and dynamic searches in different contexts, critically assessing the information found from different sources and properly choosing it.
	<b>5. Constructing new personal information using information processing strategies with the support of digital applications.</b>	<b>5.1.</b> Organizing and constructing new knowledge using generic digital devices.	<b>5.2.</b> Organizing and constructing new knowledge using the basic options in specific digital devices.	<b>5.3.</b> Organizing and constructing new knowledge by combining different digital devices and using the standard options of specific devices.
	<b>6. Organizing and using a personal work and learning environment with digital tools to perform in the knowledge society.</b>	<b>6.1.</b> With guidance, organizing and using a personal learning environment which includes the personal learning portfolio using basic search, creation and communication applications.	<b>6.2.</b> Independently organizing and using a personal learning environment which includes the personal learning portfolio, using basic search and creation applications and, with the help of a tutorial, do communication exchange systems.	<b>6.3.</b> Organizing, using and independently setting up, using one's own criteria, a personal learning environment which includes the personal learning portfolio using advanced search applications and standard creation applications and communication exchange systems.

	Competencies	Level 1	Level 2	Level 3
Interpersonal communication and collaboration dimension	<b>7. Participating in interpersonal communication environments and virtual publications to share information.</b>	<b>7.1.</b> Communicating and publishing on the most common digital communication systems.	<b>7.2.</b> Managing interpersonal communication systems in order to communicate and publish on them using suitability criteria.	<b>7.3.</b> Organizing and managing interpersonal communication systems in order to communicate and publish on them using suitability criteria.
	<b>8. Engaging in group activities using virtual collaborative work tools and environments.</b>	<b>8.1.</b> Participating in collaborative activities in virtual environments using basic functionalities.	<b>8.2.</b> Participating in and developing collaborative activities while choosing the most suitable basic tools for each case.	<b>8.3.</b> Participating in, developing, organizing and managing a collaborative work environment and to carry out collaborative activities there.

	Competencies	Level 1	Level 2	Level 3
Citizenship, habits, civic-mindedness and digital identity dimension	<b>9. Engaging in citizenship and personal development activities using the digital resources common in today's society.</b>	<b>9.1.</b> Performing digital procedures using linear navigation which requires simple actions, tracking the information directly and being aware of issues related to digital identity.	<b>9.2.</b> Performing digital procedures using chains of navigation based on simple actions, automatically tracking the information and being aware of issues related to digital identity.	<b>9.3.</b> Performing all kinds of digital procedures and using a variety of Internet services to automate the management and track the information.



# Annexe 4

## Relationship between key contents in the digital field

Key contents	Fields							
	Linguistic	Mathematical	Science	Technological	Social studies	Artistic	Physical education	Civic-mindedness
1. Basic functionalities of devices				C				
2. Types of connections between devices				C				
3. Data storage and safety copies				C				
4. Basic concepts of operating systems				C				
5. Computer security	A	A	A	C	C	A	A	C
6. Robotics and programming		C	B	C				
7. Virtual and augmented reality			B	C	B	C		
8. Projection systems	B			C		B		
9. Editing tools for text documents, presentations and spreadsheets	C	C	C	C	C	C	C	C
10. Audiovisual language: still image, sound and video	C	B	B	C	B	C	C	B
11. Browser functionalities	B	B	B	C	B	B	B	B
12. Search engines: search types and methodology	C	B	B	B	B	B	B	B
13. Sources of digital information: Selection criteria and assessment	C	C	C	C	C	C	C	C
14. Selecting, sorting, storing and sharing information	C	C	C	C	B	C		B
15. Ethics and legal issues in the use and installation of programmes...	B			B	C	B		C
16. Information processing	C	C	C	C	C	C	C	C
17. Knowledge building: techniques and devices	C	C	C	C	C	C	C	C
18. Personal Learning Environment (PLE)	C	C	C	C	C	C	C	C
19. Personal Learning Portfolios (digital portfolios)	C	C	C	C	C	C	C	C
20. Communication systems	C	B	B	C	B	B	B	B
21. Netiquette	C	A	A	A	A	A	A	C
22. Collaborative work and learning environments	C	C	C	C	C	C	C	C
23. Civic-mindedness and digital identity	A	A	A	A	A	A	A	C
24. Lifelong learning: PLEs. Resources for formal and non-formal learning	C	C	C	C	C	C	C	C
25. Ergonomics - Physical and mental health	A	A	A	A	A	A	C	A
26. Safe virtual environments	A	A	A	A	A	A	A	C
27. Sustainability: Energy use, printing expenses, saving measures...			C	C	C			
28. Digital identity visibility, reputation and privacy	B	B	B	B	C	B	B	C

**A** Implicit knowledge

**B** Practical learning

**C** Content learning

## Annexe 5

### Subjects associated with the proposed activity

Competency	Subjects
3. Using basic still image, sound and moving image editing applications to produce digital documents	Social Sciences, Geography and History, Visual and Fine Arts, Music, Language and Literature, Latin and Classical Culture
5. Constructing new personal information using information processing strategies with the support of digital applications	Social Sciences, Geography and History, Foreign Languages, Tutorial class
6. Organizing and using a personal work and learning environment with digital tools to perform in the knowledge society	To be determined by the school
9. Engaging in citizenship and personal development activities using the digital resources common in today's society	Tutorial class, Natural Sciences, Mathematics, Social Sciences, Geography and History

## Annexe 6

### Reference websites of the Department of Education

Portal	Description	URL
<b>XTEC</b>	The Xarxa Telemàtica Educativa de Catalunya (XTEC) is the remote network of the Department of Education specifically serving the educational system of Catalonia. It has the following sections: Resources, Centres, Curriculum and Guidance, Educational Community, Training, Projects, Innovation, Educational Services and User Helpdesk.	<a href="http://xtec.gencat.cat/ca">http://xtec.gencat.cat/ca</a>
<b>ALEXANDRIA</b>	Alexandria is a library of resources developed by the Department of Education which is governed by the principle of cooperation and allows some kinds of digital educational materials to be posted, such as Moodle resources and activities for Teaching and Research Staff, among others, so they can later be located and exchanged.	<a href="http://alexandria.xtec.cat">http://alexandria.xtec.cat</a>
<b>ARC (application of resources to the curriculum)</b>	This space is structured and organized to provide access to instructional proposals linked to the curricular contents which help to show examples of the guidelines for implementing the core competencies.	<a href="http://apliense.xtec.cat/arc">http://apliense.xtec.cat/arc</a>
<b>EDU365</b>	Edu365 is the portal of the Generalitat de Catalunya's Department of Education targeted at students at all schools of the country, along with their families, although any user can access the resources on the website.	<a href="http://www.edu365.cat">http://www.edu365.cat</a>
<b>MERLÍ</b>	Merlí is the catalogue of digital and physical educational resources of XTEC 2.0 of the Generalitat de Catalunya's Department of Education. Its mission is to provide the educational community with a catalogue, index and search engine for instructional materials.	<a href="http://aplitic.xtec.cat/merli/">http://aplitic.xtec.cat/merli/</a>
<b>XARXA DOCENT 2.0</b>	Xarxa Docent is a social network of and for teachers. The main goals of this virtual site are: 1. To provide instructional support and aid to help instructors include LKT; 2. To offer relevant information on instruction and classroom management using ICT and digital resources; 3. To share and spread knowledge and experiences among all the participating instructors; and 4. To create a community of practice aimed at peer learning.	<a href="http://educat.xtec.cat/">http://educat.xtec.cat/</a>

# Glossary

## Accessibility

The degree to which all people can use an object, visit a site or access a service, regardless of their technical or physical capacities. In computers, accessibility includes aids like high-contrast or large-sized fonts, screen magnifiers, screen readers, voice recognition programmes, adapted keyboards and other note-taking and data-entry devices.

Accessibility applied to the content of the Internet is called web accessibility. The World Wide Web Consortium is the organization which has developed specific directives or guidelines that allow and guarantee this kind of accessibility.

## Blog

A digital diary, usually personal and chronologically organized, which can be either public or private.

In each article or blog entry, readers can leave comments (if the author allows them) and the author can then respond to the comments.

Some of the platforms where blogs can be set up are: XTECBlocs (<http://blocs.xtec.cat>), WordPress (<http://wordpress.com>) and Blogger (<http://www.blogger.com>).

## Boolean search and logical operators

A Boolean search is named after the British mathematician George Boole (1815-1864), who formulated the basic laws of logical operations which governing reasoning. The binary nature of what is called Boolean logic (true/false) makes it suitable for the binary system used in computers and has made it the underpinning of many search engines and systems.

A Boolean search is based on three logical operators: AND, OR and NOT.

AND: with this operator you will find the results that contain all the terms used in the search. For example: schools AND London: with this search you will find all the schools in London. This is the intersection of two sets.

OR: with this operator you will find the results that contain any or all of the terms used in the search. For example: schools OR London; with this search you will find information on the term 'schools' and the term 'London', although there is not necessarily any tie between both terms. This is the union of two sets.

NOT: this operator excludes any results that follow the operators. For example: schools NOT London; with this search you will find information on the term 'schools' which does not include the term 'London'. This is the difference between the second set and the first set.

## Chat

Simultaneous communication among different people via the Internet.

## Content curation application

This is a digital application that filters, compiles, labels and stores the vast amounts of information available online following a given interest.

This kind of application fosters both a critical attitude when taking decisions about the relevancy of information, while as a reader it also provides access to previously collected information.

Applications available include Scoop.it! (<http://www.scoop.it>) and paper.li (<http://paper.li>).

## Creative Commons

A kind of license based on authorship rights which allows certain uses of the work of which one is the author.

The author may or may not offer permission for their work to be reproduced as long as their authorship is recognised, and they may establish restrictions on the commercial use of their work and whether or not it can be used in derivative works.

<b>Digital competency</b>	<p>The capacity to apply knowledge and skills to resolve situations in different settings in daily life (work, education, communication, free time and others) by using digital devices. Digital competencies entail responsible, secure and critical use of the information technologies and the Internet to get, evaluate, store, produce, present and exchange information, as well as to communicate and participate in collaborative networks.</p>
<b>Digital identity</b>	<p>The set of data in a person's or community's environment generated by their presence on the Internet (profiles managed by the user, participation in different spaces and dissemination by third parties).</p> <p>Digital identity is related to issues of visibility, reputation and management of the privacy of data.</p>
<b>Digital inclusion</b>	<p>This term is used in the European Union to refer to policies related to achieving an inclusive information society.</p> <p>Digital inclusion calls for strategies to mend the digital divide and provide all of society with access to the information and communication technologies, including people at a disadvantage for different reasons such as education, age, gender, disability, ethnic background or place of residence (rural areas or remote regions).</p>
<b>Digital poster</b>	<p>This is an application which simulates an analogical poster and, given its medium, allows digital elements to be included such as videos, audio files, links, etc.</p> <p>Glogster (<a href="http://www.glogster.com">http://www.glogster.com</a>) or Buncee (<a href="https://www.buncee.com/">https://www.buncee.com/</a>) are some of the most popular applications used to create digital posters.</p>
<b>Digital wall</b>	<p>This is an application that allows users to create a digital bulletin board. Any person who knows the link can post on this bulletin board and leave a message, a photograph, a video, another link, etc.</p> <p>This application can encourage teamwork in the classroom as a collaborative page, and it can also be used as a personal file. It is very useful for collecting opinions and comments, for brainstorming, etc.</p> <p>One of the applications where users can create digital walls is Padlet (<a href="http://padlet.com">http://padlet.com</a>).</p>
<b>Generic application</b>	<p>These are widely used applications which can be used in many ways, such as a word processor.</p>
<b>Geolocation</b>	<p>Process of incorporating information on the geographic location into images, videos, audio files, etc.</p> <p>These are different applications which not only allow locations to be pinpointed but also places where the photograph or audio file were recorded to be described; likewise geolocation can plan routes, establish boundaries, measure distances, show a given part of the Earth with satellite vision, etc.</p> <p>Some of the applications that allow geolocation include: Google maps (<a href="https://maps.google.com">https://maps.google.com</a>), Google Earth (<a href="http://www.google.com/earth/index.html">http://www.google.com/earth/index.html</a>), Woices (<a href="http://woices.com">http://woices.com</a>) and Panoramio (<a href="http://www.panoramio.com">http://www.panoramio.com</a>).</p> <p>Some activities are based on geolocation, such as geocaching.</p>
<b>Infographic</b>	<p>Powerful tool that helps students create visual representations of concepts and facts. Two good examples with many available templates are easel.ly (<a href="http://easel.ly/">http://easel.ly/</a>) and Pictochart (<a href="http://piktochart.com/">http://piktochart.com/</a>)</p>
<b>Intellectual property</b>	<p>This is a series of rights pertaining to the author and/or other creators (artists, producers, broadcast organizations, etc.) regarding works and services based on their creation (see 'Creative Commons').</p>

<b>Learning and knowledge technologies (LKT)</b>	<p>This term is applied to information and communication technologies whose main purpose is educational. The goal is for the technologies to help improve the teaching and learning, assessment and organization processes which are carried out every day in the school, the classroom and the environment.</p> <p>Therefore, LKT can be viewed as learning mediated by information and communication technologies (see 'LKT plan').</p>
<b>LKT plan</b>	<p>A school's LKT plan is an instrument that formalises the governance of technology within the school's autonomy and educational projects.</p> <p>The LKT Plan contains the current characteristics of the school with regard to ICT; it also defines the school's objectives and plans for future actions.</p>
<b>Logical operator</b>	See 'Boolean search'.
<b>Meta-search engine</b>	These are search systems conducted on different search engines simultaneously, and they show all the possible results. Thus, they are used for searches when the user wants to get the maximum number of resources available online.
<b>Mindmap</b>	<p>Mindmaps originated in constructivism, which holds that meaningful learning takes place when a person links new concepts to others they already have.</p> <p>Technically speaking, a mindmap is a web of concepts. In this web, the nodes represent the concepts and the links show the relationships among the concepts. Several applications to make mindmaps include: Bubbl.us (<a href="https://bubbl.us">https://bubbl.us</a>) and Gliffy (<a href="http://www.gliffy.com">http://www.gliffy.com</a>) Popplet (<a href="https://popplet.com/">https://popplet.com/</a>).</p>
<b>Netiquette</b>	The set of rules for behaviour and manners that Internet users should follow.
<b>Personal Learning Environment (PLE)</b>	In the context of school at the level of basic education, a PLE is an environment which includes a compilation of the evidence of learning which is comprised of the personal learning portfolio (digital portfolios) and the selection of digital applications and tools which the student commonly uses to search for information, build knowledge or communicate online.
<b>Personal Learning Portfolio (digital portfolios)</b>	Article 89 of the Law on Education of Catalonia (LEC) states: "In accordance with the Department's provisions for this regulation, the personal learning portfolio digitally stores and makes accessible the documents and digital objects that result from each student's intellectual production during the learning process, from the last cycle of primary education until post-compulsory education. The content of the portfolio may be used as evidence in the assessment process."
<b>Presentations</b>	Presentations can be both on and offline. However, online tools, such as Prezi ( <a href="https://prezi.com/">https://prezi.com/</a> ) or Google Drive Presentations, are easily shareable and collaborative.
<b>QR code</b>	<p>This is a system for recording information which consists of a matrix of points, similar to a bar code. This information must be housed on the Internet.</p> <p>A mobile device in which a code reader has been installed must be used to access the information contained in a QR code.</p>
<b>Repository</b>	This is an IT system where an organization's information is stored so that its members can share it.
<b>Rubric</b>	<p>A rubric is an assessment instrument of a complex learning assignment based on a two-columned table where three characteristics are shown:</p> <ol style="list-style-type: none"> <li>the criteria for carrying out the activity,</li> <li>the attainment criteria of the activity,</li> <li>descriptions of each level of attainment according to the criteria established.</li> </ol> <p>A rubric frames the activity, and as an assessment instrument it allows students to self-evaluate as they carry out the assignment.</p>

<b>Social bookmark</b>	<p>This is an application where the user stores and organizes online resources of interest to them through labels. This compilation can be either private or public to share with other users (social labelling).</p> <p>There are different social bookmarking applications. Some examples are: Delicious (<a href="https://delicious.com">https://delicious.com</a>), Mister Wong (<a href="http://www.mister-wong.es">http://www.mister-wong.es</a>) and Diigo (<a href="https://www.diigo.com">https://www.diigo.com</a>).</p>
<b>Specific application</b>	<p>In contrast to generic applications, these are applications aimed at a very specific, precise use, such as an application to make a timeline.</p>
<b>Tag</b>	<p>Keyword for organizing digital contents which provides quick access to contents that have previously been classified.</p>
<b>Timeline</b>	<p>An application that allows users to make graphics that represent a timeline of events with the possibility of including multimedia elements to illustrate them, such as videos, links images, etc.</p> <p>Applications found on the Internet to make timelines include Dipity (<a href="http://www.dipity.com">http://www.dipity.com</a>) and Timetoast (<a href="http://www.timetoast.com">http://www.timetoast.com</a>).</p>
<b>Virtual learning environment (VLE)</b>	<p>This is a virtual space which brings together different applications that help to organize digital contents and manage learning and communication. It is also called an educational platform.</p>
<b>Web 2.0</b>	<p>This concept appeared for the first time in 2005 as the evolution of the web; in it, users cease being passive objects and instead become active agents in the creation and publication of contents, materials, opinions, etc.</p>
<b>Wiki</b>	<p>This is a collaborative website which can be edited by users from their browser so they can create, modify, link and delete the content of a website in an interactive, easy, quick way. One of the most famous wikis is Wikipedia.</p>
<b>With guidance</b>	<p>An assignment is done with guidance when it is done with external help, such as a tutorial.</p>