

LEARNING OUTCOMES

Information and Communication Technologies

7th and 8th grades

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Introduction

Scope

The learning outcomes described hereinafter highlight the skills which 7th and 8th grade students are expected to develop through the Information and Communication Technologies (ICT) curriculum. These outcomes are organised into domains, sub-domains and general outcomes, supplemented by precise and measurable descriptors, according to the following structure:

Domain

Sub-domain

1. General outcome

1. Descriptor

2. Descriptor

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The learning outcomes provide guidelines for teachers and guardians, to help them find the necessary means for helping students develop the indispensable skills and knowledge, which will in turn allow them to pursue further studies and respond to modern society's needs.

These outcomes were developed on the basis of scientific data, as well as recommendations produced under the European Digital Agenda¹ and the OECD², which underscore the importance of students using ICT as working tools early on.

The new ICT curriculum is intended for fostering the development of information and communication technologies knowledge and skills in view of achieving general digital literacy, while ensuring equal opportunities for all students. They foster in students the development of critical analysis of the function and power of information and communication technologies, while developing technology-assisted information search, processing, production and communication skills, combined with traditional search methods (books, magazines, encyclopaedia, newspapers and other information media).

¹ CEC. (2011). Digital Agenda Scoreboard, CEC.

² OECD. (2012). "E-Skills for The 21st Century: Fostering Competitiveness, Growth and Jobs", OECD.

The new ICT curriculum involves more than just the development of basic digital literacy and targets the development of pupils' analytical skills, by exploring computational environments adjusted for their ages.

Implementation

ICT in the 7th and 8th grades is taught either in a semester or a year, it is predominantly a practical subject, and is organised into domains: (i) Information, (ii) Production and (iii) Communication and Collaboration. Safety is a cross-cutting topic, addressed under the aforementioned domains. In ICT classes, pupils are expected to use computers, networks and Internet from the start. From the ICT learning outcomes presented next, teachers are required to create pupil autonomy-fostering environments, in which the pupils do all of the exploring, under teacher guidance. Therefore, the outcomes cannot be regarded as a list of contents that must be taught in a sequential and rigid fashion; they are rather the final learning objectives, which may be met every year by teachers in a different order. So, the order in which the outcomes and descriptors are listed does not suggest a mandatory sequence in which the matters must be tackled.

The teacher is free to plan the curriculum in each year, based on a careful diagnostic assessment. Depending on such assessment and the progress in each class, the teacher may choose one of the following three sub-domains to lecture in a school year, described at the end of this document: (i) Data and statistics (ii) Image and video and (iii) Websites. These sub-domains are not mandatory.

The domain “Communication and Collaboration” is addressed only in the 8th grade, due to the minimum age requirements of setting up an email address in an open/commercial server.

Classes must foster student participation in small projects, problem solving and practical exercises in the framework of a project/product development. Consequently, pupils are expected to achieve several outcomes in different domains and sub-domains while developing the projects. These projects must be done by computer, so that pupils may see IT not as end in itself, but as a powerful tool that supports communication, collaboration, data processing and problem solving. It is also suggested that pupils conduct small group projects with pupils from other schools in Portugal or in other countries (for example, projects developed in the framework of EC educational projects), supported by ICT communication and collaboration potential. Consequently, project-development, problem solving and portfolio-organisation methodologies must prevail in the classroom work.

Safety issues related to computer use and the use of other electronic devices and Internet are an ongoing concern. Special attention must be awarded to data protection, copyright and intellectual property rights, privacy protection, and user and equipment safety. Safe behaviour must be fostered continually, in compliance with digital rules of conduct.

Assessment

At the beginning of each school year, student knowledge and skills must be assessed, since there may be different degrees of proficiency in the ICT domains mentioned above; some pupils arrive in the 3rd cycle with poor digital knowledge, while others are proficient in IT and/or their use in the learning context).

Pupil assessment in this subject must be in tune with its practical and experimental nature. Focusing on the knowledge and skills developed during the different educational experiences, the assessment must be continuous and adjustable to the learning process.

Reading Suggestions

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ICT Learning Outcomes - 7th grade

Information I7

Information, knowledge and the world of technologies

1. Understanding the progress of information and communication technologies (ICT) and their role in modern World:

1. Discovering the milestones of ICT history;
2. Acknowledging the role of technologies in modern society and the potential of social web;
3. Identifying IT uses in digital citizenship contexts.

Safe use of computer and/or similar electronic devices

1. Using the computer and/or similar electronic devices suitably for data processing.

1. Identifying the basic hardware and software components of a computer and/or similar electronic devices, and exploring their functioning;
2. Acknowledging the need to keep a computer and/or similar electronic device components updated and checking for updates of classroom equipment;
3. Identifying and validating basic protection measures (antivirus, firewall) for combating viruses and other forms of attack on computers and/or similar electronic devices;
4. Learning and implementing the rules of ergonomics related with the use of computers and/or similar electronic devices.

2. Exploring different kinds of software.

1. Identifying the main differences between operating system and application software;
2. Acknowledging the concepts of intellectual property and copyright applied to software, distinguishing between free, proprietary and commercial software;
3. Organising and customising the graphic environment of an operating system;
4. Acknowledging the special care that must be exercised when downloading software from the Internet;

5. Learning suitable software installation procedures;
6. Accessing the intended application software.

3. Managing information in a computer and/or similar electronic devices in the classroom.

1. Managing files and folders in a computer and in mobile storage devices;
2. Visualising files and folders in different ways, to obtain different sorts of information;
3. Identifying the amount of file storage space;
4. Using data compression software to compress and decompress files and/or folders.

Searching information on the Internet

1. Exploring different kinds of information available on the Internet:

1. Describing briefly the development of Internet and the World Wide Web, through a small search project conducted by pupils;
2. Identifying core Internet services;
3. Using browser functions to surf on the Internet;
4. Recognising generally the meaning of Internet addresses;
5. Creating and organising a list of favourites.

2. Surfing safely on the Internet:

1. Identifying the measures that have to be taken to protect one's privacy when accessing information on the Internet;
2. Configure browser functions to surf safely on the Internet;
3. Learning and adopting safe Internet browsing behaviour.

3. Searching information on the Internet;

1. Searching information on the Internet in digital encyclopedias, repositories, etc., or using search engines, in a systematic and coherent fashion, in line with specific objectives;
2. Learning the basic functions of a search engine and implementing search criteria definition strategies for filtering the results obtained;
3. Exploring information from different sources and in different formats (text, image, sound and video).

Analysing information on the Internet

1. Analysing critically available information:

1. Selecting search results in a systematic and coherent fashion, according to the set targets;
2. Analysing information quality using approved instruments;
3. Analysing the relevance of information in the context of a given project;
4. Learning criteria for assaying the credibility of information sources;
5. Assessing the quality of the information collected by checking different sources, authorship and up-to-datedness.

2. Respecting copyright and intellectual property rights:

1. Identifying violation acts of copyright and intellectual properties rights;
2. Avoiding plagiarism consciously;
3. Learning about proprietary/open, free/commercial licensing rules and *Creative Commons*, or the like.

3. Conducting information search and analysis on the Internet on a specific topic:

1. Choosing a topic and performing group work;
2. Planning in groups the tasks and stages of the work to be performed;
3. Conducting search on the Internet on the set topic;
4. Collecting information from different sources;
5. Analysing the collected information;
6. Systematising the collected information;
7. Identifying the sources used to work on the project.

Production P7

Document drafting and publishing

1. Drafting a text document and designing graphic objects, based on the search and analysis of information collected on the Internet on a specific topic of the curriculum, using the basic functions of a document editing and drafting tool, installed in a local computer or available on the Internet:

1. Drafting a new document or using a template in a suitable format for the proposed end;
2. Using the information collected from other sources suitably (digital or analogue), taking care in the transfer thereof to a document;
3. Ensuring compliance with copyright and intellectual property rights of the information used;
4. Localising and replacing information in the working document;
5. Formatting document content suitably (font, paragraph alignment and spacing, indentation, borders and shading or other, as necessary);
6. Inserting bullet points and numbers in paragraphs, according to the document's needs and purposes;
7. Inserting and managing objects in a document suitably;
8. Moving margins and inserting headers, footers and page numbers and, where necessary, inserting page and section breaks in the document;
9. Applying different styles for including table of contents automatically in the document;
10. Saving the document in different locations and different formats.

Drafting and editing multimedia presentations

1. Creating an original multimedia presentation on the topic of the project developed in the sub-domain "Document drafting and editing", using the basic functions of a multimedia presentation editing tool, installed in the local computer or available on the Internet:

1. Developing or using an appropriate multimedia presentation template, with the format and content for the envisaged purpose, according to the set topic;
2. Learning and applying information organisation rules to multimedia presentations;
3. Using the information collected from other sources suitably (digital or analogue), taking care in the transfer thereof to a presentation;
4. Ensuring compliance with copyright and intellectual property rights of the information used;
5. Editing and formatting the text of the presentation;
6. Inserting multimedia objects in the presentation;
7. Adding colour schemes, transitions and animations to the presentation;
8. Saving the presentation in different locations and several formats;
9. Presenting the work to the class (or to a similar audience).

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ICT educational outcomes – 8th grade

Communication and Collaboration CC8

Learning about and using different kinds of IT tools suitably and safely, in conformity with the communication contexts, rules of conduct and procedures of individual digital environments

1. Identifying different communication tools, and selecting the appropriate one for the intended type of communication:

1. Briefly exploring different tools and communication environments on the Internet;
2. Choosing the appropriate IT tool for the relevant context.

2. Learning and using email in real project situations:

1. Creating an email address in compliance with personal data protection best practices;
2. Entering, managing and closing the email account safely, acknowledging the special care that must be exercised and adopting safe behaviour;
3. Adopting safe behaviour when managing unwanted emails and paying attention to *phishing*;
4. Sending email messages in an adequate and responsible manner;
5. Using the domain “To”, “Cc” and “Bcc” adequately for sending emails;
6. Attaching documents to an email;
7. Opening attachments in safety and saving them in another location or storage device;
8. Creating and organising a list of contacts with at least one group of addressees.

3. Accessing forums on the Internet in a safe and suitable fashion, to perform real projects:

1. Registering in a forum, in compliance with personal data protection best practices;
2. Identifying the rules for participation in a forum;
3. Interacting and participating adequately in a forum;
4. Learning and adopting safe measures for participation in a forum;
5. Adopting suitable behaviour when participating in a forum.

4. Learning about and using instant messaging and chat services adequately and securely, in real-life situations of project development:

1. Using instant messaging to communicate simultaneously with one or more people in their contact network and using video conference systems, where appropriate;
2. Creating and managing safely and responsibly a network of contacts;
3. Learning and applying best practices in the use of instant messaging and adopting safe use behaviour;
4. Participating in chat rooms online, namely those available on the school's learning platform;
5. Participating in chat rooms online in a safe and responsible manner;
6. Applying expertise in a real debate situation between pupils and a teacher and/or expert, on a specific topic, either in the framework of an ICT project or in another context.

5. Learning and adopting rules of conduct in online communication:

1. Using different remote communication tools in a secure and responsible manner;
2. Learning and adopting safe behaviour when sharing data in communicative situations;
3. Identifying deliberate, repeated and hostile behaviour by a person or group with intent to harm another person, and knowing the procedures to be followed in these cases.

Language use and linguistic propriety in different online communication contexts

1. Learning different language uses connected with forms of communicating through the Internet:

1. Distinguishing formal from informal register, according to the communicative context (situation, topic, interlocutor status, degree of proximity/distance between participants);
2. Learning different linguistic strategies according to the communicative purpose (inquiry, responding to an inquiry, acknowledgement, apologies, etc.);
3. Performing practical tasks, using one or more communicational tools, e.g. inquiries, answering an inquiry, acknowledgement, apologising, etc.

2. Adjusting language to online communication contexts:

1. Adjusting language to the degree of formality of the online communication event;
2. Using appropriate linguistic strategies in writing, and resorting only moderately and according to the context to typical oral strategies (abbreviations, informal language);
3. Adjusting language to the communicative purpose.

Network communication and collaboration

1. Collaborating online as a personal learning strategy and contributing to other peoples' learning processes through the sharing of information and knowledge, and using learning and teaching platforms:

1. Learning and using platforms to interact with classmates, teachers and experts or others, thus supporting individual or group learning;
2. Registering in and accessing a learning and teaching platform;
3. Identifying different uses of learning and teaching platforms;
4. Participating in activities available on the platform (namely the programmed activities under the ICT curriculum and provided on the pupil's school platform);
5. Cooperating in group work or projects on a specific topic, in the framework of practical projects developed under the ICT curriculum;
6. Adopting suitable behaviour when participating in a learning platform.

2. Using social networks in a secure and responsible manner to communicate, share and interact:

1. Getting to know and respecting players and the operating rules of a digital social network;
2. Learning to identify the risks of social network use and adopting safe use practices, namely respect for data privacy;
3. Managing the profile adequately, by making it available only to members of the family and close friends;
4. Disclosing and managing personal information in a secure and responsible manner;
5. Managing, in a secure and responsible manner, the list of users in a network of friends, contacts and followers;
6. Complying with copyright when disclosing or sharing texts, pictures, sounds and/or video;
7. Learning about the potential of social networks in terms of sharing information, cooperating, accessing knowledge and disseminating ideas;
8. Building collectively, through a social network, a webpage on a topic of interest for the ICT curriculum;
9. Creating an interest group and participating actively in it, through a social network, focusing on a relevant topic of the ICT curriculum.

Information search

1. Searching information on the Internet about a pre-established topic:

1. Collecting information independently in line with the objectives proposed;
2. Searching information in a systematic and consistent manner, in line with concrete objectives;
3. Applying advanced search features of a search engine;
4. Implementing redefinition strategies of search criteria for filtering the results obtained;
5. Exploring, independently, information in different sources and different formats (text, image, sound and video).

Information analysis

1. Analysing critically and autonomously information available, collected in the framework of a specific project:

1. Analysing search results in a systematic, coherent and autonomous manner in line with the set objectives;
2. Assessing the relevance of information in the context of a given project;
3. Learning information selection criteria based on source credibility;
4. Acknowledging the quality of the information collected by checking different sources, authorship and up-to-datedness.

2. Complying with copyright:

1. Adopting a conscious behaviour of avoiding plagiarism;
2. Identifying violation acts of copyright and intellectual properties rights;
3. Learning about proprietary/open, free/commercial licensing rules and *Creative Commons*, or the like.
4. Learning how to include in a school document free licensed contents using the Internet.

Information management

1. Managing data stored on the Internet efficiently:

1. Exploring Internet data storage services;
2. Opening a user account in a storage service;
3. Keeping data in a local computer or in the Internet, and distinguishing between the two;
4. Managing and sharing documents on the Internet, namely projects developed under the ICT curriculum or other subjects.

2. Ensuring data safety:

1. Learning the criteria for creating secure passwords;
2. Dispensing ones passwords suitably;
3. Understanding generally the action and propagation of different kinds of viruses;
4. Applying data protection measures against computer virus infection;
5. Backing up data and understanding the importance thereof;
6. Learning in general terms how to block *phishing* attacks;
7. Identifying secure procedures when using e-commerce services.

Production P8

Exploring computer environments

1. Creating collaboratively an original product on a specific topic, using computer tools and environments which are adjusted to the pupils' age and stage of cognitive development³, available on a local PC or on the Internet. The goal is to develop a digital way of thinking, based on describing and solving problems and on organising ideas logically.

1. Targeting a problem or developing a project from an interdisciplinary perspective, hereby contributing to the use of IT skills and knowledge in other subjects (e.g. languages, sciences, history, maths, etc.);

³ For example, *Scratch* (scratch.mit.edu, kids.sapo.pt/scratch and eduscratch.dgidc.min-edu.pt), *Squeak Etoys* (www.squeakland.org and www.squeaklandia.pt) or *Kodu* (fuse.microsoft.com/page/kodu and www.microsoft.com/portugal/educacao/suiteaprendizagem/kodu.html), consulted in July 2012.

2. Analysing the problem and breaking it down into parts;
3. Exploring structural components of programming (variables, decision and repetition structures, or other responding to project needs), which are available on the programming environment;
4. Implementing a logical sequence for problem-shooting, based on the premises of logic programming and using structural components of programming;
5. Inserting contents (text, image, sound and video) in line with the project goals, while fostering pupil creativity for product development (games, animations, interactive stories, simulations, etc.).
6. Complying with copyright and intellectual property rights of the information used;
7. Analysing and thinking about the solution found and its applicability and, where necessary, rearranging the logical sequence for problem-shooting collaboratively;
8. Sharing the product developed on the Internet.

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Development sub-domains

These sub-domains are not mandatory. They propose activities that may be conducted with pupils and may or may not be included in the class plan for any level of schooling.

(i) Data and statistics

1. Using, in a simplified way, the functions of a worksheet in a local computer or available on the Internet to produce basic documents, based on a joint class project or on search work conducted previously.

1. Planning a project that involves the collection and statistical processing of data from surveys, data bases and other sources (digital or analogue), and subsequently presenting the results;
2. Introducing and processing data on a worksheet;
3. Editing and formatting cells and data in a table;
4. Using simple calculation formula and functions for processing data in a specific project;
5. Producing simple charts with the data entered in the cells as required;
6. Including tables and charts produced during an ongoing project in a multimedia presentation or in a text or hypertext document;
7. Saving the presentation in different locations and different formats;
8. Presenting the work to the class (or to a similar audience).

(ii) Image and video

1. Producing an original video, based on the joint class project or on search work conducted earlier, using the basic functions of a video editing and production tool, installed either in the local computer or available on the Internet.

1. Obtaining from the Internet or through electronic devices digital pictures, sound and video, according to the production project that is being developed;
2. Analysing and selecting contents for the ongoing project;
3. Ensuring compliance with copyright and intellectual property rights of the information collected;
4. Using the contents selected from different digital media, in line with the purpose of the ongoing production project;
5. Performing basic text, image, sound and video editing functions available on the tool used and/or in a separate application;
6. Adjusting the product to the set purpose;
7. Presenting the work to the class (or to a similar audience).

(iii) Websites

1. Designing, editing and publishing a Website, based on the joint class project or on search work conducted earlier, using the basic functions of the hyper-document editing and production tool, available on the Internet.

1. Planning and designing a website, setting goals, contents, the target-audience and the graphics;
2. Designing a website based on a template or adapting the format and presentation of such template to the envisaged purpose;
3. Developing and /or adjusting contents according to the chosen topic or to the ongoing production project;
4. Including and formatting the developed / adjusted contents, collected from different digital media, in line with the purpose of the ongoing production project;
5. Using the information collected from other sources suitably (digital or analogue), while securing safe transfer of such information to a hyper-document;
6. Ensuring compliance with copyright and intellectual property rights of the information collected;
7. Publishing and managing a website.