



Education in Information and Communication Technologies

Session 9

How to develop a Computational Thinking Module

Máster Universitario en Formación del Profesorado de Educación Secundaria
Obligatoria, Bachillerato y Formación Profesional

Facultad de Formación del Profesorado y Educación

Computational Thinking

1. Theoretical Foundation
 - Definition. Benefits of early age development of computational thinking
 - Common tools
2. Activity Design
 - Guide for Scratch first steps
 - Developing an interactive game
 - Describing activities to include in the game, and other independent activities

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Theoretical Foundations

- Develop a “Theoretical Foundations” section, with the subsections you deem necessary. The sections should develop the module bearing into mind:

1- Include conceptual and procedural aspects as well, and relevant tools for the module

2- Develop a section listing (without elaboration) the primarily attitudinal aspects for the module

This is a group work. It is important to perform a joint review of the document in order to homogenize the writing style.

Phases for the Theoretical foundations part:

- Search and analysis of information
- Content selection
- Section development
- Global review
- Concept maps developing
- Compilation of bibliography and other resources
- Compilation of the glossary of terms

Activities

Include here a set of activities developed to help achieve the needed abilities to use the related technologies
Suggest different types of activities

- 1. **Guide to follow the “theory” class.** Set of questions that are being discovered in the presentation, and should be answered by following the presentation. This helps the student attention to be focused on the presentation.*
- 2. **Questionnaire** with short questions, fill-in-the-gaps concept map, etc. that spans the contents of the topic, in order to strengthen the knowledge (to be done as an out-of-class activity).*
- 3. **Practical Activities** using a relevant tool (in-class and out-of-class). Include here a script or guidelines for the task.*

Using the activities proposed, select some of them for:

In-class work (50 minutes):

The rest of your class mates will play the role of students of your class. You should develop a detailed **work script** for the activities you consider appropriate.

Out-of-class work (2 hours)

- Select some **practical activity** for the rest of your classmates (to be done out-of-class)

Bibliography and other resources

Include here all the resources used. If they are web pages include a title and a short description of the contents

Appendix 1. Concept map

Develop some (one or more) concept maps summarising the main aspects of the topic

Appendix 2. Glossary of terms

Glossary of relevant terms for the module. This includes concepts, tools, and computing technologies. Use some ordering criteria, such as alphabetical, subject matter, etc.

Presenting the work

Each group will have 2 hours

1. *First part (30-45 minutes) for the oral presentation about the Theoretical foundations*
 - *Every group member should present some part of the module*
2. *Second part (60-75 minutes) for a practical workshop of activities for the module*
 - *The other groups will play the role of students and will develop the in-class activities.*
 - *Every group member should take active part in the activity.*

Assessing the activities and grading

Each group should manage the delivery of activities, and perform the assessment according to the developed criteria. Results should be notified to the teacher (with a breakdown explanation if possible)