UAB
Universitat Autònoma de Barcelona

2018/2019

Laboratory and Virtuality in Primary Education

Code: 102088
ECTS Credits: 6

Degree	Type	Year	Semester
2500798 Primary Education	OT	4	0

Contact

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Use of languages

Principal working language: catalan (cat)

Some groups entirely in English: No

Some groups entirely in Catalan: Yes

Some groups entirely in Spanish: No

Prerequisites

Students should have already passed the two previous courses "*Ensenyament i Aprenentatge del Coneixement del Medi Natural, Social i Cultural*" in 2nd year and "*Didàctica de les ciències experimentals*" in 3rd year.

Objectives and Contextualisation

The course "Laboratori i Virtualitat" aims that participants, at the end of the course, will be able to:

1. Know and know how to use the different existing ICT for science teaching and learning (virtual tools, digital devices, mobile technology, etc.).
2. Understand the characteristics of the experimental work in primary education and how this can be supported by various ICT.
3. Incorporate ICT in science education, integrating them across all the educational planning.
4. Identify positive and negative aspects of each teaching ICT.
5. Provide reflections on the educational changes that implies introducing ICT in school.
6. Acquire criteria for selecting, using and designing virtual environments that foster scientific skills (exploration, observation, classification, prediction, variables control, etc.).

Skills

- Design and regulate learning spaces in contexts of diversity that take into account gender equality, equity and respect for human rights and observe the values of public education.
- Design, plan and evaluate education and learning processes, both individually and in collaboration with other teachers and professionals at the centre.
- Develop the functions of tutoring and guidance of pupils and their families, attending to the pupils own needs. Understand that a teachers functions must be perfected and adapted in a lifelong manner to scientific, pedagogical and social changes.
- Foster reading and critical analysis of the texts in different scientific fields and cultural contents in the school curriculum.
- Generate innovative and competitive proposals in research and in professional activity.
- Know and apply information and communication technologies to classrooms.

- Know the curricular areas of Primary Education, the interdisciplinary relation between them, the evaluation criteria and the body of didactic knowledge regarding the respective procedures of education and learning.
- Reflect on classroom experiences in order to innovate and improve teaching work. Acquire skills and habits for autonomous and cooperative learning and promote it among pupils.
- Work in teams and with teams (in the same field or interdisciplinary).

Learning outcomes

1. Identifying aspects common to all the experimental sciences and examining them in depth.
2. Identifying the difficulties in the teaching and learning of experimental sciences, and designing activities that respond to the diversity of students learning experiences.
3. Identifying, describing, and analysing the characteristics pertaining to management of the area of experimental sciences in the classroom, and the implementation of activities involving experimentation and the use of CLTs.
4. Knowing how to communicate and present an argument in science lessons.
5. Planning for scientific learning situations in contexts outside of the school.
6. Produce and apply resources related to the teaching and learning of experimental sciences.
7. Promoting the use of explanatory models.
8. Relating science with its technological applications, with its social impact on the didactic situations pertaining to the school.

Content

Section 1: ICT and scientific practice in classroom. Which ICT shoud we use, when, how and why?

Section 2: Digital tools for enriching the experimental activities in school: mobilephones, digital sensors, digital lenses and videos.

Section 3: Digital tools for working with virtual models in the classroom: animations, simulations, video games and virtual laboratories.

Section 4: Digital tools to communicate scientifically: interactive whiteboard and Scratch language.

Methodology

The course "Laboratori i Virtualitat" combines different kind of work: laboratory experimental activities, experimental field activities and computer room activities. Is particularly important work in small groups and whole-class discussions.

Activities

Title	Hours	ECTS	Learning outcomes
Type: Directed			
Section 1	5	0.2	6, 3, 5, 8, 4
Section 2	15	0.6	6, 3, 5, 8, 4
Section 3	15	0.6	6, 1, 2, 3, 5, 7, 8, 4
Section 4	10	0.4	6, 3, 5, 8, 4
Type: Supervised			

	5	0.2	
Tutoring Section 2	5	0.2	
Tutoring Section 3	5	0.2	
Tutoring Section 4	5	0.2	
Tutoring for final exam and reflective work	15	0.6	
Type: Autonomous			
Autonomous work for elaboration of deliberables	60	2.4	6, 3, 5, 8, 4
Preparation of final evaluation	13	0.52	6, 2, 3, 5, 7, 8, 4

Evaluation

The evaluation of the course "Laboratori i Virtualitat" include different sections:

- Classroom participation: 10%.
- Activities about use of ICT in schools (3 along the course): 15% each one; 45% in total.
- Final reflective work: 20%
- Final exam: 20%.

Relevant information:

- According to the UAB regulation, plagiarism or copying of any work will be penalized with a 0, without any possibility to repeat the activity (both for individual or collective works).
- Class attendance is mandatory: students must attend all classes to be evaluated (it is allowed a maximum of 20% of incidents), otherwise it will be considered as not evaluable.

Evaluation activities

Title	Weighting	Hours	ECTS	Learning outcomes
Activity with ICT 1	15%	0	0	6, 3, 5, 8, 4
Activity with ICT 2	15%	0	0	6, 1, 2, 3, 5, 7, 8, 4
Activity with ICT 3	15%	0	0	6, 3, 5, 8, 4
Clasroom participation	10%	0	0	8
Final exam	25%	2	0.08	6, 2, 3, 5, 8
Final reflextive work	20%	0	0	6, 1, 2, 3, 5, 8, 4

Bibliography

Chivite, J. (2010). Com influencia la temperatura en el creixement de les hortalisses en un hivernacle. *Ciències. Revista del Professorat de Ciències d'Infantil, Primària i Secundària,* 17, 2-6.

Colette Murphy (2003). *Literature Review in Primary Science and ICT*. A NESTA Futurelab Series - report 5.

Demkanin, P., Kibble, B., Lavonen, J. Josefa Guitart Mas, Jozefina Turlo (2008). *Effective use of ICT in Science Education*. University of Edinburg.

Hennessy, S., Wishart, J., Whitelock, D., Deaney, R., Brawn, R., la Velle, L., McFarlane, A., Ruthven, K. and Winterbottom, M. (2007). Pedagogical approaches for technology-integrated science teaching. *Computers and Education*, 48 (1), 137-152.

López, V. i Hernández, M.I. (2013). El Scratch com a eina de modelització computacional. *Ciències. Revista del Professorat de Ciències d'Infantil, Primària i Secundària,* 26, 28-33.

Osborne, J., Hennessy, S. (2003). *Literature Review in Science Education and the Role of ICT: Promise, Problems and Future Directions.* A NESTA Futurelab Research report - report 6.

Pintó, R., Couso, D., Hernández, M.I. (2010) An inquiry-oriented approach for making the best use of ICT in the science classroom. *e-Learning papers,* 20, 1-14.