



IDENTIFYING DATA

Designing Research and Innovative Proposals in Experimental Sciences

Subject	Designing Research and Innovative Proposals in Experimental Sciences			
Code	V02M066V02206			
Study programme	Máster Universitario en Profesorado en Educación Secundaria Obligatoria, Bachillerato, Formación Profesional y Enseñanzas de Idiomas. Especialidad (Vigo): Ciencias Experimentales. Matemáticas y Tecnología			
Descriptors	ECTS Credits	Choose	Year	Quadmester
	3	Mandatory	1st	1st
Teaching language	Galician			
Department				
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Lecturers	Valente da Silva Couto, Maria Joao			
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General description	<p>Research methodology is the tool that allows the development of knowledge based on standardized and transversal criteria so that it can be communicated in different fields and disciplines. Likewise, research is a basic element in the process of educational innovation, and both are mutually reinforced in order to generate knowledge and new proposals to improve the learning process. Within this framework, the contents of this subject seek to promote in the educator the search for innovative proposals that respond to reality, allowing the improvement of teaching practice through research in the classroom. The bases of this process are found in action-research, which integrates three fundamental roles in the teacher: researcher, observer and educator, with three basic elements:</p> <ol style="list-style-type: none"> (1) the commitment to systematically question one's own teaching as a basis for development; (2) the commitment and skill to study one's own way of teaching; (3) the interest in questioning and testing theory in practice through the use of these skills. <p>Finally, another aspect that should be addressed by teachers is the possibilities offered by the use of new information and communication technologies (ICT) as tools in the process of educational innovation and research.</p>			

Training and Learning Results

Code	
B1	
B2	Coñecer o corpo de coñecementos didácticos ao redor dos procesos de ensino e aprendizaxe respectivos.
B10	
B16	
B17	
B18	
C3	(*)Elaborar propostas baseadas na adquisición de coñecementos, destrezas e aptitudes intelectuais e emocionais.
C5	(*)Coñecer os procesos de interacción e comunicación na aula e no centro, abordar e resolver posibles problemas.

- C9 (*)Participar na definición do proxecto educativo e nas actividades xerais do centro atendendo a criterios de mellora da calidade, atención á diversidade, prevención de problemas de aprendizaxe e convivencia
- C10 (*)Relacionar a educación co medio e comprender a función educadora da familia e a comunidade, tanto na adquisición de competencias e aprendizaxe como na educación no respecto dos dereitos e liberdades, na igualdade de dereitos e oportunidades entre homes e mulleres e na igualdade de trato e non discriminación das persoas con discapacidade.
- D1 (*)Utilizar bibliografía e ferramentas de procura de recursos bibliográficos xenerais e específicos, incluíndo o acceso por Internet.
- D2 (*)Xestionar de forma óptima o tempo de traballo e organizar os recursos dispoñibles, establecendo prioridades, camiños alternativos e identificando erros lóxicos na toma de decisións.
- D3 (*)Potenciar a capacidade para o traballo en contornas cooperativas e pluridisciplinares

Expected results from this subject

Expected results from this subject	Training and Learning Results
To know the set of didactic knowledge around the respective teaching and learning processes.	B2 C3 D1
Plan, develop and evaluate the teaching and learning process, promoting educational processes that facilitate the acquisition of the competencies of the respective courses, taking into account the level and previous results of the students, as well as their orientation, both individually and in collaboration with other teachers and professionals of the school.	C9 C10 D2
Design and develop didactic methodologies, in group or personalized, adapted to the diversity of students.	C3 D2
Acquire strategies to stimulate students' effort and promote their ability to learn on their own and with others and to develop thinking and decision-making skills that facilitate autonomy, confidence and personal initiative.	B16 C5 D3
Design and implement formal and non-formal activities that contribute to transform the school into a place of participation and culture in the context in which it is located.	B10 D2
Apply acquired knowledge and problem-solving skills to new or unknown educational environments.	B18 D2
To know and apply innovative teaching proposals in the area of specialization.	B18
Use bibliography and search tools for general and specific bibliographic resources.	B1 C3 D1
Strengthen the capability to work in cooperative and multidisciplinary environments.	B10 B17 D3

Contents

Topic

1. Critical analysis of teaching performance and good practices. Role of the experimental science teacher. Teacher, researcher in action.
2. Evaluation of educational processes in experimental sciences: methodology and basic techniques.
3. Identification of problems related experimental sciences teaching and learning processes.
4. Design, development, and evaluation of investigations to solve experimental science learning problems. (*)
5. Research, innovation and best practices.
6. The innovative teacher in experimental sciences. (*)

Planning

	Class hours	Hours outside the classroom	Total hours
Introductory activities	5	10	15
Case studies	5	30	35
Mentored work	5	20	25

*The information in the planning table is for guidance only and does not take into account the heterogeneity of the students.

Methodologies

Description

Introductory activities	(*)Exposición de temas pertinentes a enseñanza das ciencias experimentais facendo fincapé nas actividades innovadoras.
Case studies	(*)Análise e desenvolvemento de traballos para estudantes de secundaria.
Mentored work	(*)Traballos de investigación orientados a secundaria e bacharelato. Proxectos innovadores.

Personalized assistance

Methodologies	Description
Introductory activities	
Mentored work	
Case studies	

Assessment

	Description	Qualification	Training and Learning Results		
Introductory activities	(*)Exposición de temas pertinentes a enseñanza das ciencias experimentais facendo fincapé nas actividades innovadoras.	40	B1 B2 B10 B17 B18	C3 C5 C10	D1 D2 D3
Case studies	(*)Exposición e análises de casos e situacións concretas no ámbito da innovación en ciencias experimentais.	30	B1 B2 B10 B16 B17 B18	C3 C5 C9 C10	D1 D2 D3
Mentored work	(*)Deseño de investigacións e innovacións para secundaria e bacharelato.	30	B1 B2 B10 B16 B17 B18	C3 C5 C9 C10	D1 D2 D3

Other comments on the Evaluation

Assessment will be continuous through the monitoring of students, their work, projects and presentations, as well as their attendance and participation in the classroom.

Documents and files of the course work and assignments will be made available, according to the scheduled deadlines, in MOOVI virtual classroom.

In order to be eligible for continuous assessment, it is necessary to have at least 80% of assistance.

Students who did not attend class or who cannot be assessed by continuous assessment must take an exam (in-person written test).

Sources of information

Basic Bibliography

Complementary Bibliography

- Bisquerra, R., **Metodología de la investigación educativa**, UNED, 2004
- Carrasco, J. y Caldedero, J., **Aprendo a investigar en educación**, Ediciones Rialp, 2000
- Hargreaves, A., **Enseñar en la sociedad del conocimiento**, Octaedro, 2003
- Latorre, A., **La investigación-acción. Conocer y cambiar la práctica educativa**, Grao, 2003
- López Ruiz, J., **Aprendizaje docente e innovación curricular: dos estudios de casos sobre el constructivismo en la escuela.**, Aljibe, 2000
- Martínez González, R., **La investigación en la práctica educativa: guía metodológica de investigación para el diagnóstico y evaluación en los centros docentes.**, Ministerio de Educación y Ciencia, 2007
- Ruiz Tarragó, F., **La nueva educación**, LID Editorial, 2007
- Sandín Esteban, M.P., **Investigación cualitativa en educación: fundamentos y tradiciones**, McGraw Hill, 2003
- Sevillano Gracia, M. L., **Estrategias innovadoras para una enseñanza de calidad**, Pearson- Prentice Hall, 2004
- Varios, **Tecnología, Investigación, innovación y buenas prácticas**, Grao, 2010
- Boletín das Ciencias,**
- EUREKA,**
- P. González, F. Lusquiños, **Física en imaxes**, Servizo Publicacións, Univ. Vigo, 2008

Recommendations
