Universidad Zaragoza

Academic Year/course: 2023/24

63137 - Literacy in natural sciences and mathematics: educational research approaches

Syllabus Information

Academic year: 2023/24
Subject: 63137 - Literacy in natural sciences and mathematics: educational research approaches
Faculty / School: 107 - Facultad de Educación
Degree: 330 - Complementos de formación Máster/Doctorado
573 - Master's in Lifelong Lerning: Introduction to Research
ECTS: 3.0
Year: 573 - Master's in Lifelong Lerning: Introduction to Research: 1
330 - Complementos de formación Máster/Doctorado: XX

Semester: First semester
Subject type: 330 - ENG/Complementos de Formación
573 - Optional
Module:

1. General information

This subject aims to delve into specific aspects that can only be addressed from the perspective of *Pedagogical* Content Knowledge (PCK), i.e., by bringing into play specific experimental science and mathematics contents, particular contexts in which the teaching and learning processes of these contents are developed, certain teaching strategies specific to each subject, etc.

These approaches and objectives are aligned with the Sustainable Development Goals (SDGs) of the United Nations 2030 Agenda (https://www.un.org/sustainabledevelopment/es/), specifically, the learning activities planned in this subject will contribute to the achievement of Goal 4: Quality Education.

Attendance and participation in the working sessions of the subject is recommended. The contents and materials will be available through Moodle -Anillo Digital Docente- (ADD) where students will also submit their work.

2. Learning results

- To know procedures, techniques and resources to analyse teaching and learning processes related to literacy in experimental sciences and mathematics.
- To analyse and assess relevant information for the creation of research projects in the field of didactics of experimental sciences and mathematics.
- To design an educational research within the scope of the areas of knowledge involved.

3. Syllabus

1. Extension of educational research fundamentals in the didactics of experimental sciences and mathematics.
2. Examples of application of educational research methodologies in the didactics of experimental sciences and mathematics: case study, content analysis, didactic analysis, action research, the history and nature of science and phenomenological-historical analysis. Links of interest, reference publications, conferences and congresses, etc.
3. Elements of educational research design in experimental sciences and mathematics

4. Academic activities

- Work sessions - Master classes: sessions starting in October and ending in December.
- Individual teaching assignments and study / complementary readings: completion of an individual assignment (design of a research proposal).
- Tutorials - discussion/monitoring of works: throughout the sessions´ period and prior to the presentation of individual work.
- Presentation and defence of individual work - Debate / exchange and contrast of information and assessment tests.

5. Assessment system

Individual work (60% of the grade, minimum 5 out of 10).

It will consist of the **design of a research proposal:** an original and unpublished work that gathers in a practical way the learning acquired in the subject.

The following will be taken into account:

1. Clear structure, articulation between sections, spelling and presentation.
2. Clarity in the definition of the objectives and adequacy to the current problems of the topic.
3. Adequacy of the planned methodology for data collection and analysis.
4. Personal contribution to the discussion and ability to summarise.
5. Bibliographic updating and proper use of citations and references.

Presentation and defence of the research proposal(10% of the grade)**.**

In a collective work session and will be defended in a maximum time of 10 minutes. The following will be taken into account:

1. Use of communication skills.
2. Clarity in the definition and communication of objectives. Realism in the proposal of goals.
3. Explanation of the chosen methodology, type of activities and resources used.
4. Ability to defend and argue their own ideas.
5. Attention to the assigned time.

Active participation in different assignments, seminars and sharing sessions (30% of the grade)**.**

Work sessions in which students will have to read or consult materials suggested by the teachers with associated tasks to be included in the student's individual portfolio. The following will be taken into account:

1. Participation in discussions and group sessions.
2. Attendance to scheduled tutorials.
3. Delivery of specific assignments via Moodle.

Global test and second (and subsequent) calls for exams.

Students who have not passed the subject in the first call will be entitled to the assessment method followed so far provided they submit again the assessment activities not passed. Deadline will be the date established as official exam date.

Students who have not completed or passed the evaluable activities mentioned above may take a single overall final assessment test, which will consist of the delivery of:

- Individual work (design of a research proposal),
- Presentation and defence of the research proposal, and portfolio with the summary of five research articles published in relevant journals of the area and related to the topic of the individual work developed. Minimum length of three pages per article.

The degree to which the elements of the conceptual and methodological framework are featured in each abstract will be assessed. The results and conclusions of the articles that justify their inclusion in the individual work will also be taken into account.

Notice

It should be noted that the University of Zaragoza's Rules of Coexistence will apply to irregularities in the assessment tests through academic fraud, and article 30 of the Rules of Learning Assessment will also apply to irregular practices other than academic fraud.