

MSCI102 Science Education: Fieldwork, Projects and Assessment of Coursework

ECTS Value: 5 ECTS

Overall Objectives and Outcomes

In this unit students will explore and evaluate teaching and learning practice especially focusing on fieldwork in science, projects in science and student assessment and evaluation. Students will design assessment criteria and rubrics, create links between theory and practice and develop skills to plan, implement and critically evaluate fieldwork sessions and creative science-based projects that explore the role of independent and group study in fostering positive science understanding and attitudes.

By the end of this module, the learner will be able to:

Competences

- a. Organise fieldwork sessions that complement and extend learning in the classroom;
- b. Organise science projects that challenge students' current learning and aim to develop creativity and non-linear thinking skills;
- c. Develop appropriate assessment strategies that are relevant and contextualised for the students, including continuous formative assessment and assessment rubrics.

Knowledge

- a. critically analyse a wide variety of approaches and content organisation of areas in science fieldwork, subject specific assessment and value development within projects;
- b. critically analyse the characteristics of an effective science-based project;
- c. critically analyse the characteristics of an effective field visit;
- d. critically analyse the characteristics of an effective assessment strategy;
- e. demonstrate an understanding of the underpinning framework relating to various local and global science projects;
- f. infer results from an assessment rubric;
- g. measure and interpret readings from scientific instruments in the field;
- h. create relevant fieldwork activities and investigations at the local regional and global level through the use of technology.

Skills

- a. Demonstrate a general understanding of the field of science assessment, science fieldwork and science project-based work;
- b. Utilise scientific skills and scientific instruments in the field and make them accessible to all students;
- c. Understand, organise, plan and develop science-based field sessions relevant to various contexts;
- d. Engage students with the dynamic nature of science and its scientific method, through science-based projects;
- e. Use a variety of assessment instruments and criteria to maximise student understanding;

- f. Support students in interpreting and building understanding and skill in science.

Assessment Methods

This module will be assessed through: Presentation; Assignment.

Suggested Readings

Core Reading List:

1. Shepardson D., (2011). Assessment in Science: A Guide to Professional Development and Classroom Practice. Springer Netherlands.
2. Bennett J., (2014). On Teaching Science: Principles and Strategies That Every Educator Should Know, Big Kid Science, Boulder, CO.
3. Booker L., and Kop K. (2013). The 5Es of Inquiry-Based Science, Shell Education, CA.
4. Almarode J., (2018). Visible Learning for Science; What Works Best to Optimize Student Learning, Sage Publications.

Supplementary Reading List:

1. Kind, V & Kind P.M. (2008) Teaching Secondary “How Science Works” London: Hodder Education
2. Ireson G & Twidle J (2006) Reflective Reader: Secondary Science Exeter: Learning Matters
3. Hart, S. et al (2004) Learning without limits Open University Press
4. Hollins, M. (Ed) (2011) ASE Guide to Secondary Science Education. London: ASE
5. Monk, K. and Osborne, J. (ed.) (2000) Good Practice in Science Teaching. What research has to say Open University Press
6. Mortimer, E. F. and Scott, P. H. (2003) Meaning Making in Secondary Science Classrooms