Study program: Class Teacher Education	

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Type and level of studies: Bachelor studies, first cycle degree program

Course unit: Development of scientific literacy in the primary school teaching

Teacher in charge: Jelena M. Mladenović, PhD, Assistant Professor

Language of instruction: English

Course status: Elective

ECTS: 5

Semester: Winter Semester (V)

Course unit objectives

Development of scientific literacy (scientific terminology) and functional literacy (scientific terminology for describing natural phenomena); training for understanding scientific concepts and procedural scientific literacy (understanding and using the scientific method); developing multidimensional scientific literacy (understanding science, its history and significance for man).

Learning Outcomes of Course unit

Students will be able to:

- Independently state and scientifically explain the basic scientific concepts (natural phenomena and processes) that are studied in the first cycle of primary education and upbringing;
- Lead an argumentative discussion on the results of international examinations of student achievement and teaching in mathematics and natural sciences (comparison of results from different cycles of TIMSS and PISA tests), critically interpret information and analyze data;
- Scientifically interpret data and evidence (analyze and evaluate data, claims and arguments in different presentations and draw appropriate scientific conclusions, discuss evidence);
- Recognize the cause-effect relationship and to recognize when that relationship cannot be established;
- Nurture and develop students' scientific thinking skills;
- Evaluate and design scientific research (plan, conduct, describe, evaluate research and suggest ways to solve problems)
- Recognize the importance of research as a product of scientific curiosity;
- Notice the differences between scientific data and spontaneous concepts, misconceptions;
- Independently and in a group, develop and structure a system of scientific concepts (from general, to special and individual, networks of concepts) that are studied within the subjects and topics in the first cycle of primary education and upbringing;
- Distinguish evidence from propaganda, science from pseudoscience and connect knowledge from different scientific disciplines;
- Orally present the results of independent or group work in front of a group of students.

Course unit content

Theoretical classes: Defining key scientific concepts that are studied in the classroom; literacy in science and scientific literacy; attitudes towards science; the nature of science; asking questions, gathering evidence; modern concepts in teaching and teaching science in primary school; research (Inquiry-Based Science Education-IBSE) method; learning based on research, learning through authentic problems; critical analysis of TIMSS and PISA tests and student achievement; reliable source of information; analysis of information from scientific journals; reports and discussions on science in popular media; creativity in science; problem identification and solving specific tasks and situations; finding solutions by connecting knowledge from different scientific disciplines; application of scientific knowledge in modern life; activism (community-based science literacy); school projects with the aim of developing scientific literacy in students; scientific programs; extracurricular learning, science centers.

Literature

Marušić-Jablanović, M., Gutvajn, N., Jakšić, I. (2017). TIMSS 2015 in Serbia - Results of an international research on the achievements of 4th grade elementary school students in mathematics and natural sciences. Belgrade: Institute for Pedagogical Research.

Milanović-Nahod, S., Šaranović-Božanović, N., Šišović, D. (2003). The role of concepts in the teaching of natural sciences, Proceedings of the Institute for Pedagogical Research, 35, 111-130.

Pavlović Babić, D., Baucal, A., Kuzmanović, D. (2009). Scientific literacy, PISA 2003 and PISA 2006. Ministry of Education, Institute for the Evaluation of the Quality of Education and Upbringing, Institute of Psychology, Faculty of Philosophy, University of Belgrade, Belgrade.
PISA results 2018 - https://www.oecd.org/pisa/publications/PISA2018_CN_SRB.pdf
Snow, Catherine E. and Dibner, Kenne A. Editors (2016). Science Literacy: Concepts, Contexts, and Consequences. National Academies of Sciences, Engineering, and Medicine. Washington, DC: The National Academies Press. https://doi.org/10.17226/23595. -превод

Number of active teaching hours				
				Other classes
Lectures: 30	Practice: 0	Other forms of classes: mentoring system	Independent work: project work, presentations	

Teaching methods

Teaching is realized in the form of lectures through: interactive work (individual and in small groups), integrative approach to teaching content, discussion, workshops, solving problem tasks and realization of research activities – The inquiry method (IBSE), analysis of PISA tests and student results, methods of working on the text, student presentations, analysis of the results of student independent work, and application of modern technology.

Examination methods (maximum 100 points)			
Exam prerequisites	**No. of points**	**Final exam**	**No. of points**
Student's activity during lectures	10	written examination	/
Practical classes/tests	40	oral examination	30
Seminars	20	....	

Grading system		
Grade	**Number of points**	**Description**
10	91-100	Excellent
9	81-90	Exceptionally good
8	71-80	Very good
7	61-70	Good
6	51-60	Passing
5	≤50	Failing