Socrates - Comenius 2-1-2006-1

Improving Quality of Science Teacher Training in European Cooperation - constructivist approach (IQST)

THE LIST OF INITIAL SCIENCE TEACHERS COMPETENCIES IN THE CONTEXT OF CONSTRUCTIVISM

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2007

Unit of Competence	Competencies	Content of Competencies	Comments
1. General competencies in Educology	1.1. Competence in critical thinking	1.1.1. Knows classical and modern concepts of natural science education, perceives its major differences, qualities and drawbacks. 1.1.2. Knows the natural science situation at national, European and worldwide level.	1.1.1. on the basis of modern natural science concepts positively evaluates learners' research work and their ability to apply scientific research methods in the educational process; does not overestimate the importance of science (is not a radical 'positivist') and encourages learners' discussions, interpretations and creativity; 1.1.2. is interested in the newest information and modern methodologies as well as in the latest results of research on natural science education and on the issues of science education. The obtained information is used for stimulating the process of natural science education.
	1.2. Organizational competence	1.2.1. Ability to successfully combine classical and modern concepts of natural science education in practice and to predict the most efficient means of educational impact. 1.2.2. Ability to organize the teaching/learning process through communication and collaboration. 1.2.3. Ability to accept alterations.	1.2.1. Orientation to modern natural science education tendencies helps with stimulating practical learners' activities (observation, experimentation), applying scientific cognitive methods in the teaching process, planning and implementing research projects and indicates how to assess the researched data and make comments on findings and presentations of the carried out investigations. The teacher simultaneously understands that interaction between the learners including speaking, interpretation, discussion etc. and questioning help with acquiring abilities and knowledge of natural science education. Therefore, they are not afraid of Socratic teaching technology and work together with their students to find the true answers to the raised questions; 1.2.2. perceives that exactly the social interaction leads to the process of constructing knowledge. Although the interpretation of an appropriate event can carry an individual character, however, in most of the cases, the structure or understanding of a specific natural science phenomenon/object should have common features. Thus, the students are offered favourable conditions of reciprocity and active collaboration;

			1.2.3. understands that s/he cannot be only a knowledge or experience 'provider' and depending on a situation, acts as a teacher-assistant, teacher-adviser, teacher-moderator, teacher-partner and teacher-scientific tutor.
	1.3. Competence in solving problems	1.3.1.Ability to quickly and efficiently solve the problems of the quality of students' natural science education and the questions of natural science education as a subject; ability to establish the qualitative changes in natural science education	1.3.1. Planning the educational process (daily activities), appropriate coping with teaching/learning purposes and tasks and regular evaluation of learners' achievements, progress and the whole educational/training process help with examining specific issues of natural science education. Moreover, scheduled activities are aimed at foreseeing the problems encountered along the process beforehand and focus on finding optimal solutions. On the basis of the evaluated data, the teacher improves the process of natural science education and thus makes impact on the teaching/learning results.
	1.4. Creative and innovative competence	1.4.1. Ability to create original ideas; faculty of initiative; resourcefulness	1.4.1. It is relevant trying to engage the students in natural sciences, stimulating activities focused on projects and scientific research, dealing with specific issues of natural science education.
	1.5. Communication competence	1.5.1. Ability to cooperate and work in team; 1.5.2. Ability to apply skills; ability to adopt experience of other people; 1.5.3. Ability to think flexibly; 1.5.4. Ability to discover natural science education	1.5.1. Able to collaborate through gaining and sharing good experience and achievements in the field of natural science education. Frequent collaboration in methodical groups at school and the city when good experience is known at national and international level. Thus, the majority of teachers of natural sciences are offered possibilities of developing their skills. This is teacher's expression of the ability to work in concentrated and remote teams of science teachers. 1.5.2. Social interaction leads not only to the process of knowledge construction but also to the transformation of skills (adaptation). Depending on changes in the tendencies of natural science education, circulation of other teachers' good experience and constant innovations in the technical teaching/learning environment, a constructive teacher finds the ability to change personal skills extremely relevant. S/he is not only a teacher but also a learner who communicates and

		achievements; 1.5.5. Ability to defend one's point of view with self-respect	collaborates with other people around him/her. 1.5.3. Ability to think flexibly becomes important to participating in and organizing natural science, environment protection and creative project-based activity; 1.5.4; 1.5.5. The majority of research carried out in the field of natural science education illustrates that society's interest in natural sciences is very low; the larger part of the youth does not see any links with the above mentioned sciences; it is supposed that in the nearest future, society will feel lack of natural science teachers. Therefore, the abilities to reveal the achievements in the fields of natural science and science education become a burning issue. This is the way to attract society's attention to the mentioned sciences. The dissemination of individual good experience, the publication of personal ideas and attitudes are very important to the teachers of natural sciences as the ability to defend one's point of view with self-respect is a highly important matter.
2. Efficient competencies	2.1. ICT competence	2.1.1.Ability to use ICT; 2.1.2. Ability to use ICT for the purposes of natural science education;	2.1.1. The teacher is computer literate which is important to making the educational process more diverse; 2.1.2. When applying ICT in the educational process and optimally using the Internet, the teacher raises the possibilities of teaching/learning and promotes educational alterations. The ability to use and apply ICT in the educational process helps the teacher with becoming an expert in the field of natural science education.
	2.2. Knowledge and information management competence	2.2.1. Ability to self-sufficiently raise professional qualification; 2.2.2.Mastering a concept system that falls into the 'natural science education' category; 2.2.3. Comprehension of scientific knowledge; 2.2.4. Understanding,	2.2.1. Strives for continual perfection, participates in teacher training events, is engaged in the latest methodical and scientific information on the issues of natural science education, adequately evaluates and optimally applies it in practical activities; 2.2.2. For example, environment study, natural history, sensual perception of nature...; 2.2.3. about nature, the interaction

		comprehension and management of the most important natural science theories, laws and consistent patterns in different situations.	between nature and society, nature and technologies, nature as a unique phenomenal system; 2.2.4. for example, the cell theory, the law of conservation of energy, symmetry, polarity, periodicity etc.;
	2.3. Competence in establishing value-based attitudes	2.3.1. The awareness of nature as a value; 2.3.2. Ability to reveal the potential of natural science education of different educational subjects in secondary school	2.3.1. respect for life concept; 2.3.2. to foster learners' love and respect for nature, the need to protect environment; to make students interested in the environment protection lookouts, to foster their cognitive and value-based relations with the outward natural environment; to teach students properly behave and act in nature, to disclose the negative patterns of unacceptable behaviour in nature.
	2.4. Competence in conducting research	2.4.1. Ability to plan and supervise the students along the research on natural science;	2.4.1. Predicts the required material resources and research instruments, chooses suitable research tools, helps with recording and processing the researched data etc.
	2.5. Competence in making content	2.5.1. The secondary school students' knowledge and comprehension of matter, the goals and tasks of natural science education. The knowledge of general curricula and didactic attitudes of natural science education standards; 2.5.2. the secondary school students' knowledge of contemporary natural science tendencies, mastering natural science education forms, methods and patterns; 2.5.3. the ability to schedule and manipulate the process of natural science education in secondary school.	

10/09/2007