Socrates - Comenius 2-1-2006-1

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

Using Laboratory to Enhance Student Learning and Scientific Inquiry

(Description of the Units for Direct Teaching)

Bayburt 2008

Description of the Unit 1 (direct teaching)

Seminar	Activities
Number	1
Topic	**Constructivist Science and Laboratory Education Resources**
Goals	To be aware what constructivist science is To know the steps of constructivist science laboratory instruction
Time	3x50 minutes
Materials	Study material for the Module: Constructivist Science and Laboratory Education Resources Unit 1
Strategy/ Method	Independent reading, Team work, Role Play- one of the students plays the role of constructivist teacher and ask questions to the class; other students plays student role. But after the sample case situations, it is recommended to criticize the role of student teacher and also student. Aims, questioning styles are criticizes in order to create the best constructivist lab education. Discussion of the similar implication of the case study on page 5. Student learning and meaningful learning could be enhanced by classroom discussion in which the concepts in these lessons are applied to specific examples.
Reflection/ Comments	How can a constructivist science teaching can contribute to a better science teaching and learning? What make constructivist science lab teaching superior than the traditional science teaching and learning?
Developed Competencies Of Constructivist Science Teacher	Able to use science teaching actions, strategies and methodologies. Able to use prior conceptions and student interests to promote new learning. Monitor students' understanding of content through a variety of assessment strategies, provide positive feedback to students to assist learning Knowledge of science and constructivist science teaching and learning

Description of the Unit 2 (direct teaching)

Seminar	Activities
Number	2
Topic	**Constructivist Science Teaching Techniques**
Goals	To foster a learning environment supporting conceptual understanding; To promote positive attitudes toward science learning.
Time	3x50 minutes
Materials	Study material for the Module: Constructivist Science Teaching Techniques Unit 2
Strategy/ Method	Independent reading, Team work, Critic points, Role Play- one of the students plays the role of constructivist teacher and ask questions to the class; other students plays student role. But after the sample case situations, it is recommended to criticize the role of student teacher and also student. Aims, questioning styles are criticizes in order to create the best constructivist lab education. Discussion of the similar implication of the case study on page 5. Student learning and meaningful learning could be enhanced by classroom discussion in which the concepts in these lessons are applied to specific examples.
Reflection/ Comments	What are the weak and strong sides of the student-teacher? What do you suggest him/her to get a better teaching style? What are your additional suggestions to promote constructivist science lab teaching?
Developed Competencies Of Constructivist Science Teacher	Know the values, beliefs and assumptions inherent to the creation of scientific knowledge within the scientific community and compares science with other ways of knowing Analyze why curiosity, honesty, cooperation, openness and scepticism are important to scientific explanations and investigations. Able to use advanced technology to extend enhance learning Able to use prior conceptions and student interests to promote new learning Participate the activities of the professional community to include colleagues, organizations, to improve student learning. Reflect on professional practices and continuous efforts to ensure the highest quality of science instruction.

Description of the Unit 3 (direct teaching)

Seminar	Activities
Number	3
Topic	**Scientific Process Skills and Scientific Inquiry**
Goals	to improve scientific process skills; to promote positive attitudes toward learning and teaching science.
Time	4x50 minutes
Materials	Study material for the Module: Scientific Process Skills and Scientific Inquiry Unit 3
Strategy/ Method	Independent reading, Internet resources, Team work, Discussion. For Science and Science Laboratory Knowledge & Skills of 8th Grade students: http://www.internet4classrooms.com/skills_8th_science_tx.htm This website is really a good resource for student teacher and also teacher about to guide how to teach about scientific process. After checking these case samples, students compare them with constructivist science teaching style and conclude.
Reflection/ Comments	What are your opinions/suggestions about this website teaching style on scientific process skills and scientific inquiry samples?
Developed Competencies Of Constructivist Science Teacher	Analyze local, regional, national, or global problems or challenges in which scientific design can be or has been used to design a solution. Analyze how scientific enterprise and technological advances influence and are influenced by human activity. Understand how to plan and conduct scientific investigations. Synthesize a revised scientific explanation using evidence, data and inferential logic. Able to establish interactions with students, including questioning techniques that promote learning and achievement.

Description of the Unit 4 (direct teaching)

Seminar	Activities
Number	4
Topic	**Meaningful Learning, Nature of Science**
Goals	To comprehend the nature of science; To improve meaningful learning.
Time	4x50 minutes
Materials	Study material for the Module: Meaningful Learning, Nature of Science Unit 4
Strategy/ Method	Independent reading, Internet resources, Team work, Discussion. http://www.middleschoolscience.com/apple.htm Objectives of this website is to stress the importance of observations (nature of science) according to constructivist science teaching. (Including; thinking questions, procedures, questions for discussions, teacher notes). This website is really a good resource for student teacher to guide how to teach about nature of science. Checking such kind of websites may help student-teachers' to get different perspectives and help to develop their creativities.
Reflection/ Comments	What kind of questions we can ask to our students for promote NoS and meaningful learning, Why, answer on your sample case study.
Developed Competencies Of Constructivist Science Teacher	Analyze how scientific knowledge and technological advances discovered and developed by individuals and communities in all cultures of the world contribute to changes in societies. Apply understanding of how to report complex scientific investigations and explanations of objects, events, systems and processes, and how to evaluate scientific reports. Achieving deep understanding of complex ideas that are relevant to students' lives.