Summary:
A new approach in science education can be developed through integrating modern technologies in learning activities. Thus, science teachers designed and implemented KLIC Scenario in Turda Salt Mine that is a new approach on teaching gravitational acceleration through an informal activity. This was done by using the KLIC system during a trip to Turda Salt Mine that allows Physics to become closer and more friendly to the pupils, by involving them in experiential, active learning situations.

Aims:
At the end of the learning activity the students will be able to improve and develop the competences of:
- formulating hypothesis
- realize experiments, by using KLIC system
- finding and analyzing information and data
- communication and interpersonal relationship

Main activities:
The Romanian teachers designed and implemented a scenario in an informal environment to study the gravitational acceleration by means of the experiment with a gravitational pendulum (experiment existing in the upper secondary physics syllabus) on the platform of the salt mine entrance (outside) and then in the deepest point (112 m).

Narrative:
The informal learning activity designed and implemented is significant because it exploits creatively the pupils knowledge concerning the concepts of movement, acceleration, interaction. It offers to the pupils the opportunity to test their own scientific hypothesis and their applicability in new learning contexts. In order to measure the gravitational acceleration, the technology used was InLOT system that consisted of leg and arm accelerometer, base station – collect all transmitted data, user interface, software.

Step 1. Determination of the gravitational acceleration value: through the experiment with a gravitational pendulum on the platform, in front of the salt mine entrance.

Step 2. Brainstorming session:
Students express their own hypothesis, referring to the expected value of gravitational acceleration inside the salt mine, on the following issues:
- Will the value of gravitational acceleration increase or decrease?
- Why?

Step 3. The students and the teachers go down into the salt mine: The students do again the experimental determinations of the gravitational acceleration to the deepest point (112 m).

Step 4. Discussing the initial hypothesis:
- Analyze the significance of the obtained experimental results
- Which of the predictions/ expectations were fulfilled?

Step 5. Reflection:
- Causes that influenced/ produced these results

Step 6. Evaluation - Students worksheet:
During the outdoor activity, the students filled in a personal worksheet, referring to:
- Their expectations
- Description of the experiment
- Description of the materials used
- Determination of the values of gravitational acceleration on the entrance platform and inside the salt mine
- Factors that could influence the results of the experiment
- Quantitative data and the qualitative observations

Teachers’ Competencies:

1. subject matter/content knowledge
2. nature of science
3. Multidisciplinary
4. knowledge of contemporary science
5. variety of (especially student-centred) instructional strategies
6. lifelong learning
7. self-reflection
8. teaching/ learning processes within the domain
9. using laboratories, experiments, projects
10. common sense knowledge and learning difficulties
11. use of ICTs
12. knowledge, planning and use of curricular materials
13. Information and Communication Technologies with Technological Pedagogical Content Knowledge
Develop multiple goals:
• understanding big ideas in science including ideas of science, and ideas about science
• scientific capabilities concerned with gathering and using evidence
• scientific attitudes

Doing science: experimenting, analyzing, interpreting, redefining explanations:
Understanding students' concepts and learning style about science phenomena:
The curriculum developers and researchers designed and delivered an in-service training program for Physics teachers. This program included: the teachers learn about KLiC system and KLiC scenarios. Then, curriculum developers, together with the teachers designed an outdoor activity that was implemented by the teachers who worked in peers. Experts and curriculum developers gave the feedback concerning the effectiveness of the activity.

Cooperation among teachers and with experts:

Assessment: formative ~ of students' learning and the summative ~ of their progress:

Activities for gaining knowledge, not for entertainment, nor for simple imitating of results:
The students are curious, active, involved and serious in accomplishing their tasks. The trip to Turda Salt Mine had a specific goal and a specific question to answer related to gravitational constant.

Building interest in natural science phenomena and explanations:
As the teachers are creative and use experiments and new technology tools, the students are motivated to understand the phenomena and their curiosity is exploited.

Building up informed citizens. Students understanding the nature of Science & Science in society:
Being involved in experiments, the students formulate and review the scientific explanations and models, using logic and experimental evidences. They become scientifically literate, informed citizens because they formulate their conclusions and argumentations by means of physics scientific language and concepts in real contexts.

Understand science as a process not as stable facts. Using up to date information of science and education:
To memorize facts and information is not the most needed ability. The scenario presented gives the students the opportunity to investigate in real life environment, to gather and use information, to understand and control reality. In order to get the best results, orientated discovery and new technology were used.

Activities for gaining knowledge, not for entertainment, nor for simple imitating of results:

Building up informed citizens. Students understanding the nature of Science & Science in society:

Understanding students’ concepts and learning style about of science phenomena:
Helping the students to ask questions, to operate with scientific concepts and to use new technology in their experiments, they will be able to solve problems on science phenomena.

Understanding science as a process not as stable facts. Using up to date information of science and education:

Activities for gaining knowledge, not for entertainment, nor for simple imitating of results:

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