The Past and Presence of the SSIBL in Hungary

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Aims of the SSIBL
– Enhance the scientific literacy of the society
– Education of responsible adults
– Education of committed teachers to SSIBL

Good examples

Characteristic features and methods of SSIBL was applied in Hungary
Inductive and experiment-based teaching method
Association of the social content and the physics
Important fields: nuclear physics, environmental physics, sustainable development, climate change etc.
Interdisciplinary character and connection with the everyday life
Environmental teacher training was launched at the ELTE in 1992.

Critical thinking, risk estimation
Low risk is acceptable
George Marx (1927-2002) a Hungarian professor of theoretical physics was pioneering the introduction of the risk estimation into the school teaching. [2]
The nuclear risk
For example in nuclear field the risk is determined by the ALARA principle (As low as reasonably achievable). George Marx was particularly sensitive to misunderstandings concerning the use of nuclear energy.

A story from the time of Chernobyl
– the importance of critical thinking
George Marx’s story about a Hungarian school: in 1986 radioactive cloud reached Hungary: “In one school pupil quared at the door of the physics laboratory early in the morning, asking for the teacher: ‘let us measure the background again!’ It turned out that it was three times higher than a month before, causing great excitement. They demanded that the windows be opened. ‘Let the Chernobyl radioactivity come in!’ it was done, and the activity fell to the old value. The morning increase was due to the accumulation of radon in the unventilated classroom during the night. This lesson these students will never forget. Radioactivity around us is a fact of life. Nuclear fallout can be measured exactly, as we did in Hungarian secondary school after Chernobyl, and as we have monitored radon since.”

The moral of the story
High technology can be controlled. Understanding facts influence the response of the citizens, the collective decisions of a nation in important questions. This is a prerequisite for the realization of democracy.

Understanding our environment
The GLOBE (Global Learning and Observations to Benefit the Environment) program was launched in 1994 in the US to promote the teaching and learning of science. Hungary joined to the GLOBE program in 1999. At present 30 secondary schools are participating in the program.
2011 – GLOBE Students Practice Sun Photometer Use in Kiskunhalas, Hungary

Activity connected with the environment
Environmental observation: in meteorology, pedology, water chemistry, botany and zoology. Environmental education can be efficient only if it treats the world in its unity and the role of the parts is found within this framework. This is the reason why we initiate each year student competitions of photography, poem, short story and drawing which demonstrates the relationship between human and its environment.

Can teachers explain the everyday phenomena?
– not enough to show the role of the physical laws in the explanation of everyday phenomena – should interpret the explanation at secondary school level
Course: Everyday Physics in the curriculum of teacher training Content:
Physics of cars (acceleration and braking, movement in the bend, physics of Forma I, energy consumption of cars etc)
Physics of weather (clouds, storms, lightning, weather forecast etc.)
Physics of sports

Presence of the SSIBL
Key players are teachers
Main tools of mediating the elements of SSIBL (RRI, IBL, CE, SSI) toward teachers:
– postgraduate TPD teacher training course incorporated into Physics Education PhD program
– an optional University course in teacher training on GLOBE
– a conference on Teaching Physics Innovately (TPI-15)

Postgraduate teacher training
The PhD program
Physics Education PhD program launched 10 years ago at ELTE
– tailored specifically for the needs of active in-service physics teachers
– candidates carry out their research at their own school
– research topic examples: Non-conventional modern physics in the classroom, Environmental physics in the high-school, Enhancement of the activity of pupils with interest in humanities, Teaching physics outdoors, etc.
The TPD course
TPD course according to the Objectives of PARRISE:
– “Current Contents and Methodology in Teaching Physics in the 21st Century”
– in-service teachers
– four modules of the Physics Education PhD program
– methodology focused on the pillars of the PARRISE Framework
– good practice presentations on IBL, PBL, RRI
– educational interpretation of social sensitive scientific issues

Optional University course on GLOBE
Goal: to integrate the GLOBE program more deeply into the high school education.
Conditions: young teachers should be familiar with the GLOBE program.

GLOBE in teacher training
A one-semester optional course for BSc and MSc students in Earth and Environmental sciences and for future teachers.
Content: Main part various environmental measurements
An overview of the history of the predictions on the future of the mankind and the Earth (Malthus 1798), Club of Rome (1968), recent UNESCO report “Shaping the Future We Want”

A conference which created an engaged community
Teaching Physics Innovately (TPI-15)

New Learning Environments and Methods in Physics Education
Visit to the Maintenance and Training Center at Paks Nuclear Power Plant
http://globe.elte.hu/tpi-15/slides.php

Topics:
Inquiry Based Science Education, Science centres and informal learning opportunites, Environmental issues, Our cosmic environment, Socially sensitive issues, Multimedia and ICT, Physics experiments and methodological innovations, Contemporary physics, Nuclear issues, Roundtable discussion about socially sensitive issues in physics education.

– the proceedings is available online as an e-book [1]
– the separate papers are also accessible with their conference abstracts and presentation slides a discussion “forum” is associated to each paper http://parrise.elte.hu/tpi-15/slides.php
– the final version of the Proceedings will be generated and printed as a book soon


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