

Comment

Science popularization and European citizenship in Poland

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Introduction

Among many descriptions of citizenship it may be characterized as a set of certain behaviours and values in the scope of culture, economy and symbolic representation, as well as a package of civil, political and social rights and obligations determining the membership of individuals in organized communities.¹ Scientific research and education are crucial factors for culture constitution and determine the economic growth. Thus, they exert essential influence on the social organization and in consequence on its members – citizens. From historical point of view the notion of citizenship has meant the affiliation with a certain national or state community. All the relevant values, rights and duties are inculcated in a way embedded in historical tradition and may appear as natural. Being a European, on the other hand, is not a native feature and requires education. The European education understood as a cultivation of certain universal values featuring democratic societies aims at the dissemination of the feeling of European integration among youth. European citizenship should not substitute but supplement national citizenship. Other words, European citizenship should broaden the scope of citizen rights by granting certain rights in other member states of the European Union.²

European citizenship in a Polish school

European education has been present in Polish schools since 1990 being conducted as inter-subject educational paths, such as “The European Education” and “The Polish Culture in the scope of Mediterranean tradition”.³ During these courses teachers spread the ideas of the united Europe, shaping civil attitudes and the connections between Polish and European culture among students. More and more schools introduce teaching classes, most often regarding natural sciences in foreign languages. This activity is naturally embedded in pro European events applying both the universality of scientific knowledge and a European language as its medium. Individual curriculums⁴ are yet another educational activities allowing for shaping active civil attitudes. One of the main aims of such programmes is to make students believe in the efficiency of active participation in the creation of European order assuming interpersonal cooperation and the biased development in accord with nature.

Apart from school classes the development of intercultural education, which is the basis for active European citizenship, is maintained by the European School Clubs actively working on all the levels of education. Their leaders meet once a year to share their experiences. Another major factor in the development of the sense of European citizenship and the strengthening of the European education is based on the direct cooperation between Polish and other European schools. Schools participate in international projects, some of which regard natural sciences, e.g. Primary School in Barcików – “Water flux in the nature”, Gimnasium⁵ no. 11 in Olsztyn – “Mosaic of culture and science”, Gimnasium in Rybinik – “Water – a treasury of Europe”, Primary School in Barda – “Eureka – Europe or small and great inventors” and so on.

European citizenship and hard science education

The outcome of the debate of physics teachers from Warmia and Mazurian Lakes district which has taken place in the Olsztyn Planetarium as a part of the SEDEC project⁶ is clear – they acknowledge endorsing the sense of European citizenship among students. Most often they undertake the following activities: during classes on physics recall the history of this and other related disciplines (e.g. astronomy), point the European roots of the natural sciences in the antiquity and apparent influence of European scholars in the later development of these disciplines, underline the universality of natural laws and the benefits coming out from the introduction of integrated scientific units.

During the teaching on physics and geography students are presented with the process of the evolution of philosophical ideas of the world structure from the early and non scientific beliefs of ancient societies through the geocentric idea of Ptolemy up to the heliocentric theory of Copernicus. Students learn the crucial role of the famous European sailors of the age of exploration in the creation of modern vision of the world. Many Polish schools have taken part in the initiative of the individual measure of the Earth circumference using the ancient technique of Eratosthenes simultaneously learning modern techniques of measuring the shape of the Earth.

In the geographic education there are presented processes of coming from isolation to integration: cooperation between societies, integration and disintegration processes in Europe (with a special stress put to Poland's role), the meaning of Euro regions and twin cities as an example of the international cooperation on the regional and local levels.⁷

These topics serve the educational aim of endorsing the sense that real possibilities of overcoming barriers between people depend not only on the governments but rely on the activities on the local and individual levels. It is essential to develop the consciousness of the necessity to take part in the integrating activities on the levels of Euro regions, voivodships, districts, communities and schools as well as to seek new forms of activities and cooperation platforms.

Teachers also point international relations in the scientific community, free exchange of ideas and the cultural role of the development of natural sciences. Many possibilities in this field are enabled by the extra mural school activities targeted at the youth interested in gaining the knowledge on the field of natural sciences.

The European aspect of natural sciences education is underestimated, especially when taking into account their universal character and swift possibility of application as a kind of medium for the integration ideas. There is still much to be done, especially in case of such European projects as SEDEC.

Pro European extra mural educational activities

Within the Comenius 2.1 project the European Commission accepted 65 projects assuming Polish participation in the years 2001 – 2005. This includes 15 projects (23%) regarding natural science education and 10 projects (15%) regarding European citizenship.⁸

Polish secondary schools take active part in the European educational project EU-HOU - Hands-On Universe,⁹ which is coordinated by the University of Pierre and Marie Curie. Apart from many European counterparts, there are about 40 Polish schools. The project includes the institutions from 8 European countries which help prepare classes with the application of modern astronomical research techniques. The programme disseminates a new method of teaching by applying remote telescopes and radio telescopes. Students aided by a coached teacher conduct real-time observations of astronomical objects with the means of remote grand telescopes located in various places on the globe and then individually draft the outcomes using the software prepared by the project. It is a perfect opportunity of learning scientific techniques, studying various astronomical objects together with accompanying physical phenomena and sharing experience with foreign colleagues. The main aim of the project is to disseminate the interest in natural and hard sciences, while thus gained experience can help students in their prospective careers, which may develop in the integrating Europe.

Another form of activity of EU-HOU is conducting the observations of big parts of the sky in the participating schools with the means of appropriately prepared small Internet cameras. It was the initiative of late professor Bohdan Paczyński and is currently coordinated by the Centre for Theoretical Physics of the Polish Academy of Science¹⁰ and the Institute for Nuclear Studies of the Polish Academy

of Science.¹¹ These observations are conducted as a part of IASC (International Asteroid Search Campaign). In this field the Polish schools have had some successes. The first planetoid to be discovered was the K07G04A found by the students of ZSO nr 7 in Szczecin. The next one, K07G02H, was found by the students of Tadeusz Czacki High School in Warsaw and the following one - K07G51K – by the students of X High School in Toruń. All the Polish discoveries were proved by the Minor Planet Center, which on behalf of the International Astronomical Union gathers the data on small objects in the Solar System.

G. Gandolfi et al.¹² has grasped the role of a planetarium as a medium of science popularization: „Science is the key ingredient in a planetarium, and our efforts are aimed at conveying the excitement of the processes of reasoning, discovering and experimenting”. This paradigm is actively supported by planetariums in Poland, among others the Olsztyn Planetarium. They have offered the teachers of nature, physics and geography the possibilities of conducting classes under the artificial sky, what is a perfect educational device for the visual presentation of topics regarding celestial sphere and the related phenomena. The Olsztyn Planetarium and Astronomical Observatory¹³ widened its educational offer by adding lessons, presentations and workshops on interesting physical and astronomical phenomena. The nature of meetings is adjusted to age and knowledge of participants. During the observation of physical phenomena we try to stimulate students’ imagination and interest by the individual discoveries of natural laws. We also hope that these engagements will influence choices of students’ scientific careers. Other interesting forms of attracting students by science and technology were introduced by the Planetarium of W. Dziewulski in Toruń.¹⁴ This facility introduces students in a modern way with contemporary astronomy and research on the Solar System.

This aim is also facilitated by many contests for children and youth organized by planetariums. The most important is the Astronomical Olympiad organized by the Planetarium of Copernicus in Chorzów.¹⁵

We also act for the dissemination of knowledge of natural sciences among children, youth and adults. Weekly lectures given by scientists from Poland and recently abroad for lay audience give an opportunity to learn history of astronomy and most recent achievements of European and other scientists discovering fascinating secrets of the universe we live in. All the participants may appreciate the positive role of science in the development of the contemporary society.

In 1993 there was founded the Polish Association of Science Teachers¹⁶ by the initiative of the teachers of biology, chemistry, geography and physics. The aims of the association are: social activity for the development of natural science subjects, stimulating teachers’ occupational activities, dissemination of scientific knowledge and skills as well as the integration of the educational community. Yearly conventions of the Association provide the opportunity for presentation of the achievements and novel methodological solutions, exchanging experiences on teaching natural science subjects and meeting the lecturers from Poland and abroad. The teachers who are the members of the Association cooperate within the projects „Science Across the World”, „Scientific and Technological Literacy”, „Teaching and Learning about Energy” and many others.

Translated by Albert Hupa

Notes and references

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² The treaty of Amsterdam. Amending the Treaty on European Union, the Treaties Establishing the European Communities and Certain Related Acts, Amsterdam, 2 October 1997

³ E. Dudek, E. Szedzianis, K. Tryl, Program Nauczania Przedmiotu Przyroda dla klas IV, V, VI Szkoły podstawowej, Wydawnictwo Edukacyjne Wiking, Wrocław, 1999. (title in English: Curriculum of the subject Nature for classes IV, V, VI of primary schools, Ed. Wiking)

⁴ Fizyka i Astronomia. Przewodnik dla nauczyciela, R. Grzybowski, Operon, Gdynia 2007, Fizyka w gimnazjum, S. Jakubowicz, S. Plebański, PWN, Warszawa, 1999. (title in English: Physics and astronomy: Teachers guide, Ed. Operon) (Physics in gymnasium, Ed. PWN)

⁵ (translator’s note) Gimnasium is a secondary school in the Polish Educational System.

⁶ <http://sedec.osu.cz/>

- ⁷ E. Dudek, H. Staniów, J. Wójcik, Program Nauczania Przedmiotu Geografia dla klas I, II, III Gimnazjum, Wydawnictwo Edukacyjne Wiking, Wrocław, 1999. (title in English: Curriculum of the subject Geography for classes I, II, III of gimnasiums, Ed. Wiking)
- ⁸ Editors: M. Wasilenko, S. Malinowska, Kompendium Europejskich Projektów Współpracy Comenius Akcji 2.1 oraz Sieci Tematycznych Comenius 3 realizowanych w latach 2001-2005, Warszawa 2006. (title in English: Guide for the European Projects of Cooperation Comenius 2.1 and thematical networks Comenius 3 realized in the years 2001-2005)
- ⁹ <http://www.pl.euhou.net/>
- ¹⁰ <http://www.cft.edu.pl/>
- ¹¹ <http://www.ipj.gov.pl/pl/main.htm>
- ¹² G. Gandolfi, G. Catanzaro, G. Giovanardi, S. Masi, G. Vomero, New Perspectives in Planetarium Lectures, the paper in Editors I. Robson, L.L. Christensen, M. Kommesser, Communicating Astronomy with the Public 2005, ESA, ESO, IAU, 2005.
- ¹³ <http://www.planetarium.olsztyn.pl/>
- ¹⁴ <http://www.planetarium.torun.pl/>
- ¹⁵ H. Chrupała, M. T. Szczepański, 25 lat Olimpiad Astronomicznych, Wydawnictwa Szkolne i Pedagogiczne, Warszawa, 1986. (title in English: 25 years of Astronomical Olympiads, Ed. WsiP)
- ¹⁶ <http://www.psnpp.org.pl/>

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