

# Circles of Self-Education in Science: Innovative Methods to Mentor Talents

Posted on 2011-03-11 5:44 am by Tamas from Hungary

Category: Outreach to Marginalized Communities

Background:

Science education is on the decline in Hungary in an extremely rapid and alarming fashion and is on the decline around the world as well. Hungary used to have excellent traditions in science education, which produced, among others, J. von Neumann, E.P. Wigner, and E. Teller, each of whom had a major impact on our world by providing key contributions to computer science, nuclear reactors and national defense. Based on the still-remaining traditions of science education and also on innovative applications of modern, internet based communication tools, a new form of science club: circles of self-education in sciences is proposed. The model for such small networks of self-education in sciences, or Science Clubs, has been already proven to be effective, inspiring and successful in one particular location in Hungary. There are several other locations with similar or “resonant” traditions that can be revived and revitalized in the same manner.

The main goal of this proposal is to spread the example of a proven model from the local to a national level, engaging 5 new locations across Hungary. By capturing new experience and inspiring new talents, a new kind of educational experience can be generated, pulling together scientists, students, teachers and parents in weekly or biweekly activities related to science that can be also utilized for the international mentoring of talents, and providing inspiration, motivation, training, and promotion of science talent.

Project Description: We place emphasis on finding talent in remote, marginalized communities. We will organize Camps in small villages fighting for the survival of their schools in the face of low funding for local education, and Science Clubs in country towns where mentoring from active scientists is not yet organized.

Activities include weekly or bi-weekly meetings of science clubs in middle schools during the academic year and summer mentoring camps organized for the most active and dedicated students, scientists, and teachers. The science clubs will hold an average of 30 meetings during the academic year, while at the one-week mentoring camps about 35 topics will be covered during the summer. Nearly half of these topics are foreseen to be covered by researchers, scientist, similar number of topics is presented and discussed by students, while teachers talk rarely, only at about 10-15 % of the time. However the clubs have teacher patrons who are present at each occasion and who encourage the students to find a topic of their own choice and interest and provide directions and material. Such science clubs also include a scientist patron who gives more detailed direction and whose network among fellow scientists is utilized to involve them – so they are the contact points between the Science Club and the world of science. Students prepare their topic for discussion using modern internet based resources and mentoring help from scientists and teachers.

By May-June 2011 we will find the location of 4-5 new Science Clubs. The funding cycle will start from September 2011 and lasts till August 2012, covering the academic year followed by Summer Camps in 2012.

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These science clubs are desired to be sustainable, so we are looking for all means to make that possible. We will base these clubs on volunteerism - 2011 is designated as the European Year of Volunteering. We will keep the expenses as low as reasonably possible. Three additional methods may be detailed in the 2nd round of evaluation.

The project will be implemented by US Alumni and supporting individuals, including professors, researchers, teachers and students, as well as by supporting institutions.

Participating US Alumni include

professors, Doctors of Hungarian Academy of Sciences:

Cs. Bagyinka (biophysics)  
A. Csótó (physics)  
T. Csörgő (physics, team leader)  
D. Karátson (volcanology)  
J. Kubassek (geography)  
P. Gyarmati (mathematics,informatics)  
K. Nagy (dentistry)  
L. Nánai (physics)  
P. G. Szalay (chemistry), currently in US  
Á. Zsigmond (chemistry)

Team  
Members:

Researchers (with Ph.D):

F. Borondics (chemistry, currently in Canada)  
M. Csanád (physics)  
I. Fórizs (isotope geochemistry)  
Á. Gali (physics)  
E. Kirs (international law)  
Gy. Kovács (intellectual property law)  
Gy. Jordán (geology)

marketing specialist, engineers, consultants:

A. Kecskeméti (marketing)  
A. Nováki (environmental engineering)  
E. Márton (architect, designer, in the US)

Ph.D students:

R. Vértesi (physics)

Other partners include:

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- professors, or Doctors of the Hungarian Academy of Sciences

P. Ábrahám (astronomy, physics)  
I. Scheuring (biology)

- researchers with PhD.

G. G. Barnaföldi (physics)  
P. Ódor (biology)  
A. Ósi (paleontology)  
V. Müller (biology)

- PhD. students with M.Sc.

M. Vargyas (physics)

- Medical Doctor:

T. Solymosi (physician)

- B.Sc student

J. Csörgő (math and chemistry)

- teachers

E. Császár, Kissné (mathematics, physics)  
M. Kiss (math, physics, informatics)  
A. Kormos, Nézóné (math, physics)  
K. Kopasz (math, physics)  
I. Pálinkás (English)

- middle school students

András Cs. (BerzeTÖK Science Club, Gyöngyös)

Martin B. (BerzeTÖK Science Club, Gyöngyös)

Institutions include

- Museums:

Hungarian Museum of Geography  
Hungarian Museum of Natural History

- Research Institutes of the Hungarian Academy of Sciences

Biological Research Center, Szeged  
Inst. for Geochemical Research, Budapest

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KFKI Research Inst. for Particle and Nuclear Physics, Budapest  
Konkoly Observatory - Inst. for Astronomy  
Research Inst. for Solid State Physics and Optics, Budapest

- Universities

ELTE University, Budapest (several departments and institutes)  
Pázmány P. Catholic University, Budapest  
University of Debrecen, Debrecen  
University of Miskolc, Miskolc  
University of Szeged, Szeged

- Consulting firms:

COWI Hungary Consulting and Planning Ltd, Budapest  
QANDA Consuling, Budapest

- Supporting Middle Schools (secondary education institutions, for age group 14-18 years old)

Berze Middle School, Gyöngyös  
Dobó Middle School, Eger  
Ságvári Middle School, Szeged  
other middle Schools in  
Kiskunhalas,  
Hódmezővásárhely  
and Szeged are being contacted.  
These discussions will be finalized in May-June 2011.

Other supporting organization:

Hungarian Foundation for Innovation  
(J. Pakucs, P. Závodszy)

Who will be affected :

250 students  
40 scientists  
10 teachers  
5 middle schools (in 2011/12)

On the long run, the Hungarian middle school system may potentially be revitalized.

Region: Europe

Location: This is a country-wide project, with a pilot project going on successfully in Gyöngyös, Hungary, since 4 years. Now the goal is to strenghten it and to spread its best practices to 4-5 new locations, including middle/secondary schools in Eger,

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Hódmezővásárhely, Szeged and other locations.

It mixes good old traditions with modern communication tools. Trains scientists in communication with 14-18 years old students and teachers. Trains students and teachers in modern sciences and in web-based communication of science results. Utilizes web-based tools like archiving best presentations on youtube videos and talks in .ppt and .pdf files so that they could be used again by other science circle talks at different schools. These new educational channels will provide a local community that is educated and embedded to modern science and the tools and archives will be useful for students at more remote locations too.

Innovation: For high level reports on one of the outcomes of the prototype science club, and its innovative nature, see the following article in the prestigious Science Magazine and at the web-page of a US National Lab:

Science Magazine vol 331, no. 6014 p. 129 (2011)

<http://www.sciencemag.org/content/331/6014/129.4.full?sid=da6b0100-5b46-45b3-a2fb-fc57aa5d4ae9>

Quarks Matter at RHIC, feature story, Brookhaven National Laboratory, Upton, NY, USA, January 4, 2011:

<http://www.bnl.gov/rhic/news2/news.asp?a=2175&t=today>

In-country travel of scientists to science clubs:

4,000 USD

Operation of science clubs, compensation for teacher patrons:

15,000 USD

(30 meetings/club/year, 2 hours/meeting, 2 teachers/meeting, 25 USD/hour, 5 science clubs/country)

Estimated Science club summer camps:

Expenses:

15,000 USD

(3,000 USD/camp, 1 summer camp/club, 5 clubs.)

This is an estimate, based on the experience that the summer camps provide about the same number of lectures and mentoring opportunities as do the annual weekly-biweekly meetings during the academic year, but this will be refined if we pass on to the second round of evaluation. Details are as follows:

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About 60 participants (students + mentors) can be expected to show up at these camps, a support of 50 USD/participant corresponds to 3000 USD support request per camp. Students will be expected to contribute, too, at a rate of about 50 USD/student, to cover expenses related to their meals and basic accommodation as well as for the travel of their mentors, this is an important cost-sharing model working towards the sustainability of the project. These summer camps are recommended to be organized in small villages in a rural area, close to a small school that has a good reputation but fights for its survival. One of the goals is to give mentoring help and moral support to these schools, to their students as well as to their teachers. This arrangement also helps in keeping costs down. We will also encourage merit based primary school/middle school/private sector partnerships to support quality education initiatives in marginalized Hungarian communities.

Administration, web based management:

1,000 USD

Cost sharing is foreseen to work as follows:

Supporting museums, research institutions and universities provide the salary for the professors and researchers who volunteer to visit Science Clubs.

The grant covers their travel expenses only.

Supporting middle schools provide the facilities and meeting places for the Science Clubs. The grant covers the extra time for participating teachers from those Schools.

Other supporting organizations assist in publicity and outreach to media and general public, in disseminating the results. The grant covers necessary project related administration costs for each item, in particular if bookkeeping of the expenses cannot be organized on a voluntary basis. Experience indicates that bookkeeping costs about 10% of the itemized costs above and is at present included in each itemized expense.

Students are expected to contribute to about 50% of the minimized costs of the summer camps.

Total  
Funding  
Requested: 35,000 USD