

## Adventures on the Borderland of Mathematics and Arts: the Kaposvár University's "CrossBorderScience" Project (2011-2012)

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### Abstract

In the framework of the CrossBorderScience Project we launched an international program for Hungarian and Croatian high school students, based on experience-centered learning methods of mathematics and physics through visual arts. The events took place in Hungarian and Croatian venues. This presentation provides a short overview of the project.

In the framework of the CrossBorderScience Project (2011-2012; <http://www.crossborder.ke.hu/>) we launched an international program for Hungarian and Croatian high school students in mathematics and physics, based on experience-centered learning methods of mathematics and physics through visual arts.

The program was made possible by the generous support of the European Union's IPA Cross-border Cooperation Programme. The events were realized in 2011-2012 in Hungarian and Croatian venues with the leadership of the Kaposvár University and with the cooperation of the Petar Preradović High School (Virovitica, Croatia), Bjelovar-Bilogora County (Croatia), and the members of the Experience Workshop International Math-Art Movement ([www.experienceworkshop.hu](http://www.experienceworkshop.hu)). In addition to the above mentioned project-partners, the Táncsics Mihály High School (Kaposvár, Hungary) and the Bartola Kašić High School (Grubisno Polje, Croatia), also participated in the events connecting countries and scientific, artistic fields. The most important achievements of this project are the publication of the "Experience-centered Approach and Visuality in the Education of Mathematics and Physics" book (edited by J. Barrallo, M. Budin, A. Durity, K. Fenyvesi, S. Jablan, L. Radovic, R. Sazdanovic, E. Stettner, Kaposvár: Kaposvár University, 2012) with the contribution of more than 130 authors from all over the world, and the successful conference which we organized in order to present the new book with the participation of 200 Hungarian and Croatian teachers. Approximately 2000 Hungarian and Croatian high school students participated in our program.

We involved a number of internationally recognized representatives of experience-centered education in mathematics and physics, and recognized artists who have wide experience and innovative developments in the field of visual mathematics. Together we learned and hopefully successfully transferred the experience to our students, that knowledge in science can be useful in far more ways than solving problems in school. By revealing the secrets of mathematics and physics, we can invent interesting games or discover amazing tools, which can be useful in engineering, medicine or even in the creation of wonderful artworks.



**Figure 1:** Zometool Quasicrystal workshop.



**Figure 2:** Robert Fathauer introducing his exhibit to the Hungarian and Croatian children (left); Fathauer's tessellation workshop.



**Figure 3:** Reza Sarhangi's Persian mosaic workshop for teachers (left); Mojgan Asimi Lisar's Tazhib workshop for teachers (middle); the "Experience-centered Approach and Visuality in the Education of Mathematics and Physics" bookshow with Reza Sarhangi, Mateja Budin, Eleonóra Stettner, Slavik Jablan and Kristóf Fenyvesi at the closing conference in 2012 August.

When we build bridges between science, art and education we also promote intercultural dialogue and create interdisciplinary communities. Such bridge-building also require the fulfillment of conditions that are deeply correlated and connected to the quality of life, sustainability and the successful organization and integration of formal and informal ways of education. We need sensitive teachers, interested and supportive parents, and professionals who are cooperating and themselves devoted to the dissemination of knowledge and information. We need people who not only know how to discover the interests of the student but also know how to maintain and develop their interest. We need teachers who are open-minded, love to learn and do research and who are ready to share their knowledge, discoveries and experiences with their colleagues and their pupils: the members of future generations.