

# Integrating Technology into K12 School Teaching to Enhance STEM Education in Hungary

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## **Abstract:**

Technology is increasingly becoming an important part of STEM teaching and learning in the 21<sup>st</sup> Century. There have been numerous attempts to integrate technology into education systems, but without serious development and research the success of these attempts have been limited. Recently, together with my colleagues in Hungary, we started a project called GeoMaTech to develop high-quality teaching and learning materials for all grades in primary and secondary schools in Hungary. These materials (1200+ Mathematics, 600+ Science) will be embedded into an on-line communication and collaboration environment that can be used as an electronic textbook, a homework system, and a virtual classroom environment. In addition to material development, we will offer 60-hour professional development courses for more than 2500 teachers in 800 schools in Hungary. Furthermore, we will organize a wide-range of teacher and student activities including competitions, maths and science fairs, and develop a network of schools for the long-term sustainability of the GeoMaTech project. The technology background of the project is offered by GeoGebra (<http://geogebra.org>), which is an open-source, dynamic mathematics software used by more than 30 million students and teachers around the world. All activities of the GeoMaTech project will be assisted and evaluated by a strong research team offering support for pedagogical resources involving teaching methods based on highly-respected Hungarian Teaching Traditions by Pólya, Lakatos, Varga and Dienes as well as successful technology integration programmes from other countries. The research team will also carry out a pilot programme with approximately 3,000 students and prepare instruments for evaluating the impact of GeoMaTech on teachers' and students' learning and understanding of mathematics and science. In addition, in our project we aim to involve and collaborate with as many experts and researchers as possible from around the world. We plan to base our work on previously successful projects, collect ideas from the GeoGebra community, and invite colleagues to work with us in Hungary. We hope that this project could be a test bed for future projects and trialling ground for different ideas. In my talk, I will outline the GeoMaTech material development and teacher training initiatives, building a network of participating schools, the directions for software development, the aims of the GeoMaTech research and evaluation team, and hope we can discuss possible collaboration opportunities.

## **Short Bio:**

Dr Zsolt Lavicza

After receiving his degrees in mathematics and physics in Hungary, Zsolt began his postgraduate studies in applied mathematics at the University of Cambridge. While teaching mathematics at the University of Cincinnati he became interested in researching issues in the teaching and learning mathematics. In particular, he focused on investigating issues in relation to the use of technology in undergraduate mathematics education. Since then, both at the University of Michigan and Cambridge, working with Deborah Ball, Hyman Bass, Paul Andrews, and Kenneth Ruthven, he has worked on several research projects examining technology and mathematics teaching in a variety of classroom environments. Currently, Zsolt is working as an Associate Lecturer in Mathematics Education at the University of Cambridge. He is also co-ordinating the development of local GeoGebra Institutes and offering research support within the International GeoGebra Institute. He serves as a Director of Research at the GeoMaTech project as well as advising research projects at different countries.