

# GeoGebra stimulates education, opportunities for Collaborative Learning using GeoGebra

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## **Abstract:**

In this presentation we would like to show some possibilities for finding the funding for GeoGebra in the framework of creating new way of teacher enhancement projects. The main idea is to see GeoGebra not only as a tool to teach mathematics and sciences at various levels but also providing a way for creating Collaborative Learning Networks – new way of teachers' enhancement and lifelong learning. This framework implies the area of research and could provide the guidance for applying for grant proposals. We will also present our own experience with the implementation of projects, which aim at teacher education and creating such Collaborative Learning Network in Poland.

## **1 Introduction**

We can see GeoGebra and environment around it as a way to create new way of teacher enhancement – way to create Collaborative Learning Network. Such a network has a part of Community of Practice i.e. “a group of people who share social interaction, and some common ties between themselves and other members of the group” (Hamman, 2001) “Groups... who share a concern, or a passion about a topic...who deepen their knowledge and expertise by interacting on an ongoing basis” (Wenger et al, 2002 ) – which is based on GeoGebra Forums and Wikis as well as a bigger community (Habhab S. 2008) - Collaborative Learning Community (Wikipedia), which include Community of Practice but also includes other users – GeoGebra Instructors, instructors at teachers colleges and universities and teachers who use and maybe share their educational materials. We propose to use this framework for both research at how to improve and stimulate usage of GeoGebra in education as well as how to structure grant proposals for international collaboration.

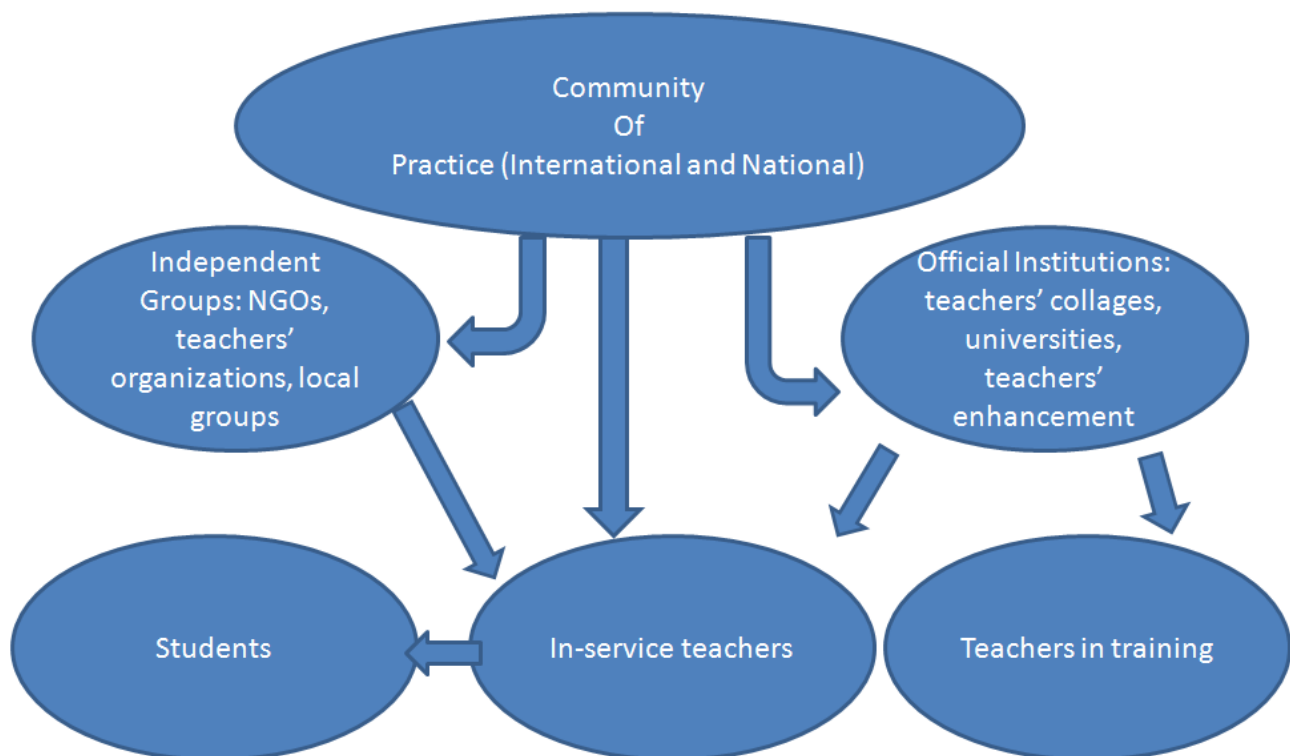
## **2 Structure of Collaborative Learning Environment for GeoGebra**

We propose that the GeoGebra Learning Environment is divided into several parts. It has a Community Of Practice – the community of highly skilled and highly motivated individuals from many countries. There is not need for immediate collaboration: they are translators of local versions of GeoGebra, creators of language version of educational materials in forms of translations, implementation, creation of their own web pages and software developers which create a group of their own. This group is very important for the development of GeoGebra. We may consider finding funds for this group but we will be interested in this paper in the other group – group which has immediate influence on the teachers and which could stimulate usage of

GeoGebra. This is right now the central problem for education (Hohenwarter M. and Lavicza Z. 2007). We are not also interested here in pre-service teachers.

Below I include the schematic way we can look at the structure of GeoGebra Learning Community:

## GeoGebra Learning Community structure



The most important and is that in-service teachers will use and implement GeoGebra into their everyday teaching. The group which could influence that is group consists of: instructors of GeoGebra connected with GIs, non-formal groups which introduce innovation like teachers' organizations, teachers' local and national Collaborative Learning Networks, local communities and finally local schools. We propose that we will focus on that group. There are several grant founding opportunities – we should provide research especially on Collaborative Learning Networks both on local and national and international level. There are several questions which should be answered:

- How such groups should be created
- What should be done that they are most effective
- What to do that they are sustainable

What grant proposal should provide:

- Coordinators
- Network building activities
- Provide means for regular communication
- Sustained support

### **3 Our Experience**

We work with in-service teachers from all over the Poland for last 5 years. We were mostly sponsored by Foundation of Polish Telecommunication Company. In 2009 we applied for a so called Norwegian grant (<http://www.eeagrants.org/>) and got money for creating an innovation network of teachers. We had partners from Norwegian Institute of GeoGebra from Trondheim. We had several working meetings in Warsaw and teachers were working with students at their schools to create projects. Meanwhile they were getting e-learning courses and where communication by means of Internet.

Warszawskie Centrum GeoGebry (Polish IGI) was created in summer 2008 and was involved in following activities:

- coordinated translation of GeoGebra 3.2 (and earlier versions),
- coordinated translation and preparation of teaching materials
- prepared GeoGebra Instructors
- started collaboration with Norwegian GI
- Created e-learning courses
- Collected material for research
- Started collaboration with some Polish researchers

### **3 Future**

We propose to work on several basis. One is to work as a Community of Practice but focus on the global view and create bigger Learning Community. To do that we should research what are the possibilities in different countries and for each country create a program which will be then coordinated by the local GeoGebra institutes and to this extend there could be created many bi- and multi-lateral grants proposals with aim of creating sustainable Learning Communities.

### **Literature**

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