Project ID : HZ-2010_1a-21767 , Coordinator : HÁSKÓLI ÍSLANDS
Title : Nordic GeoGebra Network

Application

Applicants

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Project

Project summary

Application ID:

HZ-2010_1a-21767

Title

Nordic GeoGebra Network

Purpose (describe the purpose of the project)

In each of the Nordic and Baltic countries there have been independent efforts to promote the use of GeoGebra and other software in the teaching of mathematics. The aim of the Nordic GeoGebra Network is to combine these efforts and create learning opportunities and possibilities of collaboration across our countries for researchers and mathematics teachers at all levels. The Nordic GeoGebra Network takes as its starting point the sharing of ideas and results from national projects. We want to strengthen our joint efforts to develop inquiry based learning in mathematics by integrated use of ICT, in particular the use of the software GeoGebra.
Advances in the use of ICT have changed the way we can teach and learn mathematics in a profound way. Computer programs make it possible to apply mathematics to an increasing range of societal sectors, with immense implications. Different project with regard to the evolution of technology and its connection to mathematics education are right now taking place in the Nordic countries and elsewhere.
GeoGebra, http://www.geogebra.org, is an open-source dynamic mathematics software that combines geometry, algebra, statistics and calculus and can be used for teaching mathematics at all levels of primary and secondary school as well as university. GeoGebra is translated into 45 languages including Danish, Swedish, Norwegian, Finnish, Icelandic, Lithuanian and Estonian languages. GeoGebra is freely and easily downloadable and supported by a large user community from 190 countries. The GeoGebra website currently attracts more than 400 000 unique visitors per month from almost every country in the world.

Project summary (write a synopsis of the project, not more than 250 words)

The Nordic GeoGebra Network will gather Nordic and Baltic teachers, teacher educators and researchers in mathematics education, to share materials and exchange experiences concerning the use of ICT in mathematics education. We will also use the network to assist and help each other in national and local activities. We will accomplish our goals by organizing three annual conferences, with active participation of teachers, and small scale seminars as well as running a common network website. Our cross-sectoral network involves professionals working with mathematics education at all levels of the schools systems, at universities and in governmental organizations. The participating institutions in the network are:
• Helsingin yhteislyseo, Finnish GeoGebra Network: http://www.geogebra.fi/
• Norwegian Centre for Mathematics Education, GeoGebra Institute of Norway: http://www.geogebra.no/
• The University of Gothenburg, Sweden: http://ikt.ncm.gu.se/
• Tiger Leap Foundation, Estonia: http://www.tiigrihype.ee/
• University College Capital, NAVIMAT, Denmark: http://www.navimat.dk/
• University of Iceland, School of Education: http://www.geogebra.is/
• Vilniaus Jezuitu gimnazija, Lithuania: http://www.vjg.lt/

In addition to funding from Nordplus Horizontal, the network will seek sponsorships for the conference activities in order to keep the conference fee as small as possible for attending teachers. This is crucial as most schools in our countries do not have much money for sending teachers to conferences.

Annual priority

- Quality in education
- Teacher education / pedagogical methods
- Support of Horizontal Activities

Project website

http://www.geogebra.org/nordic

Relations to other Nordplus applications

Is this application related to other Nordplus applications in this round?

No

Is this application related to previous Nordplus activities?

No

If this application is part of a network, please enter the network name here

Detailed specifications

Background/motivation for the project

The background for establishing the network is the different GeoGebra activities in each of the Nordic and Baltic countries:

Denmark
The Danish GeoGebra Institute is hosted by NAVIMAT (http://www.navimat.dk/ and soon to be http://www.geogebra.dk), the National knowledgecentre for mathematics education in Denmark. The GeoGebra Institute organizes a group of resource persons (mathematics teachers and teacher educators) who offers training sessions for groups of mathematics teachers who want to initiate or continue integration of ICT (GeoGebra) in a didactical reflected, continuously supported design. The Danish GeoGebra Institute is headed by Mette Andresen.

Estonia
In Estonia, Tiger Leap Foundation (http://www.tiigrihype.ee) manages teachers training and projects about GeoGebra (within Tiger Mathematics 2008 project). The Tiger Leap Foundation was established by Estonian Ministry of Education and Research. The founding of a national GeoGebra Institute under Tiger Leap is planned. In the universities GeoGebra is used in many courses and some future teachers are doing their master projects about the programme. GeoGebra is very popular among Estonian teachers and pupils. Tiger Leap Foundation has organized many GeoGebra courses for teachers and 15 percent of all the mathematics teachers in Estonia have participated in these courses. School teachers have made a lot of material which can be found on the webpage of the mathematics teacher community. Kristi Kreutzberg, who is a lower secondary school teacher of mathematics and works with the Tiger Leap Foundation, participates in the Nordic GeoGebra Network.

Finland
The Finnish GeoGebra Network (http://www.geogebra.fi) is a grass root project with eleven lower and upper secondary schools around Southern Finland, two of the schools are institutes of teacher education. In 2007 the network started with 5 schools (Dynamat-hanke). The teachers in the network have created many GeoGebra applets in Finnish, and they have held many meetings and lectures about the subject. In 2010 the Finnish GeoGebra Network got a new three-year grant from Technology Industries of Finland Centennial Foundation. The main goal is to study how to use GeoGebra in math lessons, how to use it with smart board and with pupils using computers. The experiences will be published and discussed on the network blog http://hylblog.edu.hel.fi/wpmu/geogebraverkosto/. The network has close collaboration with Finnish Mathematics Teachers organization, and their magazine Dimensio publishes articles written by members of the network. Mikko Rahikka, who is a teacher of upper-secondary school and a member of the board of the Finnish GeoGebra network participates in the Nordic GeoGebra Network.

Iceland
Freyja Hreinsdóttir at the University of Iceland has translated GeoGebra to Icelandic, and runs a website (http://www.geogebra.is) with teaching and learning material. Since 2008 GeoGebra is taught to all prospective mathematics teachers for primary and lower secondary school and in spring 2010 a course for upper-secondary and in-service teachers is being given for the first time. There are several master students that have or are working on GeoGebra related projects. In August the conference Nordic GeoGebra 2010 http://vefsetur.hi.is/ngg2010 will be held in Iceland.

Lithuania
Rokas Tamošiūnas at Vilniaus Jezuitu gimnazija (http://www.vjg.lt/) translated GeoGebra to Lithuanian in 2009. At the present time he is working to make teaching and learning materials suitable mainly for local use. This year GeoGebra finally started its way in schools. Interactive whiteboards are new to most teachers in Lithuania, so there will be many workshops for teachers. Lithuania will be proud to host the Nordic GeoGebra conference in 2011, and this will be a unique opportunity for Lithuanian teachers to share experiences with Nordic colleagues.

Norway

GeoGebra Institute of Norway (www.geoegbra.no) is hosted by the Norwegian Center for Mathematics Education. The centre is located at the Norwegian University of Science and Technology, and the GeoGebra Institute is run as a joint venture with Programme for Teacher Education at the University. The institute runs a national network of more than 20 certified GeoGebra instructors. Most of these instructors are teachers at different levels in the Norwegian school system. Computer literacy is regarded as a basic skill in the new national curriculum, and most pupils in upper secondary school now have got their own laptops. GeoGebra has in a short time become extremely popular in Norwegian schools. In February 2010 http://www.geogebra.org had nearly 20 000 unique visitors from Norway. The GeoGebra Institute of Norway is headed by Anders Sanne.

Sweden
Thomas Lingefjärd at the University of Gothenburg has translated GeoGebra to Swedish, and he is supervising a doctoral student who is following what happens with students understanding of integral calculus when they are using GeoGebra to illustrate, visualize and solve integral calculus problems in upper secondary school. GeoGebra will be one of the major resources for Swedish teachers to take part of and download material for from the web portal http://ikt.ncm.gu.se/. Lingefjärd is one of the project leaders for a three year project in Southern Sweden (Malmö University) in which 8 different schools (lower and upper secondary) are equipped with interactive white boards and small and cheap computers. The teachers are given in-service training in how GeoGebra can be used together with interactive white boards and then the project follows and documents how the teachers and their students make use of the technology.

The partners in the Nordic GeoGebra Network have complementing competences and experiences, and this is a good starting point for fruitful collaboration. Norway for instance has widespread use of GeoGebra in secondary school and other teachers at the same level would benefit greatly from interacting with teachers with more experience from using the software with pupils in their everyday teaching. On the other hand, the partners from Sweden and Denmark are strong on research in mathematics education. The Nordic countries can benefit from learning from countries that are rather similar in school and culture. Many of us also share a common language foundation. In the long run, the network will serve as an important initiator of ideas and professional knowledge about the use of GeoGebra in the Nordic and Baltic countries. The network will progress and include new technology in education, such as mobile learning and other teaching aids for mathematics. Our work will certainly be used as a reference when new curricula are implemented in our countries. We will create a Nordic/Baltic learning context for professional teachers and set the stage for lifelong improved teaching practice in mathematics at all levels of the educational system.

Project description (including account of planned activities/project plan)

The Nordic GeoGebra Network organizes yearly a three day conference: 2010 in Iceland, 2011 in Lithuania and 2012 in Estonia. In addition to the conferences we will organize three annual network seminars for exchanging experiences: 2011 in Norway, 2012 in Sweden and 2013 in Denmark.
We expect about 100 participants at each conference and the choice of conferences location is based on economical considerations as we are trying to attract a variety of teachers that might not have access to funding.

2010
The first conference will be held in Reykjavik in August 2010, http://vefsetur.hi.is/ngg2010, and it is being organized by the applicants. True to the spirit of the network we have chosen a variety of plenary speakers, namely the creator of GeoGebra Markus Hohenwarter, Swedish researcher Thomas Lingefjärd, Sigbjørn Hals, an experienced Norwegian upper secondary school teacher and textbook author and Juha Leino, an experienced Finnish teacher of lower secondary school. The conference is intended for teachers at all levels as well as researchers in mathematics education. It is organized around plenary lectures, contributed talks, workshops and discussion sessions. Teachers are encouraged to actively participate by presenting their own materials and share experiences from the classroom. We are certain that this will create new possibilities for interaction among teachers in different countries. During the conference we will plan a short session where we conduct a dialogue (in each language) with the participants to register their views on the arrangement of the conference and to take note of their suggestions for improvements as well as ideas for future network activities.
The website of the network will be established in June 2010, and the site will be gradually extended during the first months of the network period. The web portal should be fully functional by the end of the year 2010. Development of the portal will be based on experiences from the international GeoGebra website and the sites in Norway and Sweden.
We will use the web page to inform of the networks activities, to publish electronic conference proceedings, for ongoing web surveys and for stimulating and supporting informal network activities that may arise from

our conferences and network seminars.

2011
At the network seminar in Norway in winter/spring 2011 we will reflect on our experience from the first conference and evaluate the first months of the network period. We will also use this and the next network seminars to exchange experiences concerning our work on a national level in each country. Two participants from each country in the network will attend these seminars.
The second conference will take place in Lithuania in summer 2011.
At each conference we hope to gather 100 participants from all the Nordic/Baltic countries.

2012
The network seminar in winter/spring 2012 will take place in Sweden.
The conference in Estonia in summer 2012 will be organized in collaboration with Finland.

2013
Seminar in Denmark in winter/spring 2013: final meeting of the network. We will evaluate our work and consider future cooperation.

Description of partnership ("who does what")

The members of the network will attend all seminars and participate in organizing the conferences. They will use their local contacts to advertise the conferences and encourage active participation of teachers at all levels.

Mette Andresen in Denmark will chair the scientific committees of the conferences in 2011 and 2012. She is responsible for the review processes and the conference proceedings. Mette will also organize the network seminar winter 2013 in Copenhagen.

Kristi Kreutzberg and the Tiger Leap Foundation in Estonia will host and organize the conference in summer 2012 in collaboration with Finland.

Mikko Rahikka and the Finnish GeoGebra network will assist the Baltic partners organizing the conferences in Lithuania and Estonia. He will also be working with the seminar organizers and maintain the mailing list.

Freyja Hreinsdóttir in Iceland leads the network and serves as the main organizer and chair of the first Nordic GeoGebra Conference in August 2010. The University of Iceland is responsible for the network's accounts and for reporting to Nordplus.

Thomas Lingefjärd in Sweden will develop the network web site in collaboration with the Norwegian partner and organize the network seminar in Sweden in winter 2012.

Anders Sanne and the GeoGebra Institute of Norway are responsible for organizing the network seminar in 2011. He is also responsible for establishing and maintaining the networks website together with the Swedish partner Thomas Lingefjärd.

Rokas Tamosiunas and Vilniaus Jezuitu Gimnazija in Lithuania will, in collaboration with the Finnish GeoGebra network, host and organize the conference in Lithuania in summer 2011.

Results

Expected outcome (Please describe the expected results of your project, who willbe effected and how, directly and/or indirectly)

Note: after filling out the text below we noticed that empty lines are ignored in the pdf version so the text is very cramped, please see the attachment The expected outcome.docx is case this is hard to read. The expected outcome is more effective use of GeoGebra and other software in mathematics teaching at all levels of the school system in our countries as well as increased research activity. We expect projects to emerge from our conferences and seminars to expand and widen local efforts. Examples of this could be informal teacher to teacher contact between countries sharing ideas in their ongoing teaching, collaboration between teacher educators in organizing courses, collaboration among researchers, and cooperation among text book authors in different countries. This will effect mathematics educators at all levels in our countries. The expected outcome for each country is given below: • Denmark: The network will be of great value for us as a place to recruit teachers and teacher educators for our other project activities like for example the Fibonacci project, small and larger research and/or development projects and teaching

experiments. Workshops and discussions in the network, at conferences and seminars will be continued virtually between the physical meetings, and thereby provide us with response and advices from colleagues to inform our projects. Further, we may use the conferences and seminars for dissemination of results and experiences from such projects. • Estonia: Teachers and teacher educators will learn a great deal from the network partners' experiences. A new curriculum was approved in the beginning of 2010 and it pays more attention to the use of computers when learning and teaching mathematics. As there will be computers in the classroom, our teachers are eager to learn from other countries methods and exchanging materials. This project will motivate our teachers and educators and also we want to motivate the network partners through our ways of using GeoGebra and the competitions we have had for pupils and teachers. • Finland: In 2014 Finland will have a new curriculum for primary and secondary schools. Our work will definitely involve on that work. We will learn a lot from for example Norwegian upper secondary math teachers working with students having their own laptops. It is also very interesting to learn how GeoGebra is used in different school levels in Nordic/Baltic countries. Other countries might also learn what the Finns think why they succeed so well in mathematics in Programme for International Student Assessment (PISA). • Iceland: Being a small country with limited use of ICT in the teaching of mathematics and very few people promoting its use in teacher education it is important for mathematics teachers to meet other teachers and learn of good uses of GeoGebra in mathematics and to learn of research results from other Nordic/Baltic countries that have similar school systems. We are in the process of creating and translating teaching material for GeoGebra so learning from other countries is very valuable. • Lithuania will benefit from learning of research and teaching activities in other Nordic/Baltic countries. By hosting a conference in 2011 unique opportunity is created for Lithuanian teachers to share experiences with Nordic/Baltic colleagues. • Norway has a large community of teachers and pupils using GeoGebra in their every day work at school. This widespread use of ICT in Norwegian schools is not based on research, but to a large extent a result of individual teacher's practical adoption of the new national curriculum and the fact that nearly all pupils in upper secondary school have their own laptop in the classroom. Norwegian teachers have a lot of experience to share with teachers in the Nordic GeoGebra Network, but they will clearly benefit from having their own practice questioned by Nordic and Baltic colleagues. The GeoGebra institute of Norway will benefit from collaboration with researchers in Mathematics Education from abroad, as the research milieu on use of ICT in mathematics education is small. • Sweden will benefit from experiences in other countries where the use of GeoGebra is more widespread.

Dissemination of results (Please focus on sharing the results with individuals, organisations or groups who are not your partners in this project)

All the network partners participate in national and international GeoGebra meetings, seminars and conferences, and present results from the network activities at local, national and international level. We will publish conference proceedings after each conference and make these available electronically through the network´s website and our national websites. As members of the International GeoGebra Institute, we are frequent users of the website http://www.geogebra.org/ with more than 400 000 unique users every month from all over the world. The Nordic GeoGebra network's website will be http://ww.geogebra.org/nordic, and thus our results and activities will be easily available to the global GeoGebra community. Besides, all partners have good contacts with mathematics teachers trade unions, teacher educators in mathematics, and educational administrators, meaning that personal contacts, formal and informal collaborations, participation in other projects etc. will supply the dissemination through network reports on the network's website.

How will you evaluate that your project has met its objectives

After each conference we have meetings where we will discuss and reflect on the results. As an aid in that we will use evaluation forms filled out by participants at the conferences as well as other feedback given. We will also have ongoing web surveys at our network website where we will ask teachers to respond to the different activities conducted and presented by the network.
Through our local contacts with the GeoGebra communities in each country and their participation and interest in our conferences we will be able to monitor which new projects/cooperation emerges as a result of network activities. We will also collect visitor statistics on the networks website.

Project period

Start date

2010-06-01 (YYYY-MM-DD)

Duration

36 (In months)

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Mobility

Mobility

Travel Actuals

Network Project

Network Project

Activity

Conferences

Travel €	Board & Lodging €	Other €	Other expense description	Total €
20400	15360	135600	Conference costs, salaries	171360

Please describe the activity in detail

Three annual Nordic conferences for teachers and teacher educators with 100 participants on each conference. Travel costs, board and lodging covered for the network members. The internal salaries are the calculated value of the work days put into the activity by the network members. Conference costs financed by Nordplus grant and participation fee. Please see attached spreadsheet for details.

Activity

Seminars for exchanging experiences

Travel €	Board & Lodging €	Other €	Other expense description	Total €
14760	8820	27450	Seminar costs, salaries	51030

Please describe the activity in detail

Three annual seminars for exchanging of experiences in the network. Travel costs, board and lodging covered for the network members. The internal salaries are the calculated value of the work days put into the activity by the network members. Seminar costs financed by Nordplus grant. Please see attached spreadsheet for details.

Activity

Dissemination of results and experiences in education

Travel €	Board & Lodging €	Other €	Other expense description	Total €
0	0	6400	Web page and proceedings, salaries	6400

Please describe the activity in detail

We will publish conference proceedings after each conference and make these available electronically through the network´s website. Website will also be used to inform of other activities and to exchange information. The internal salaries are the calculated value of the work days spend on the proceedings and running the network´s website. External salary for management of the web server financed by Nordplus grant. Please see attached spreadsheet for details.

Total Budget

Total Budget

Network and Projects total	228790
Mobility total	0
Total activity	228790
Nordplus contribution network/Projects	114395
Nordplus contribution mobility	0
Total grant	114395
Own contribution (Nordplus less project total)	114395

Are you recieving funds from other funding body Yes

Description of other funds

We will seek sponsorships for the conference activities in order to keep the conference fee as small as possible for attending teachers. Most schools in our countries do not have much money for sending teachers to conferences. Sponsor money will be part of the network's "own contribution" if we get such funding. Please see the attached budget model. Examples of how different level of sponsorship influence on the conference fee: Sponsors: 0 EUR --- Conference fee: 192 EUR Sponsors: 15 000 EUR --- Conference fee: 143 EUR Sponsors: 30 000 EUR --- Conference fee: 93 EUR Sponsors: 45 000 EUR --- Conference fee: 44 EUR Sponsors: 58 190 EUR --- Conference fee: 0 EUR