

GeoGebra



GeoGebra Institute and Research

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July 2009, www.geogebra.org/IGI

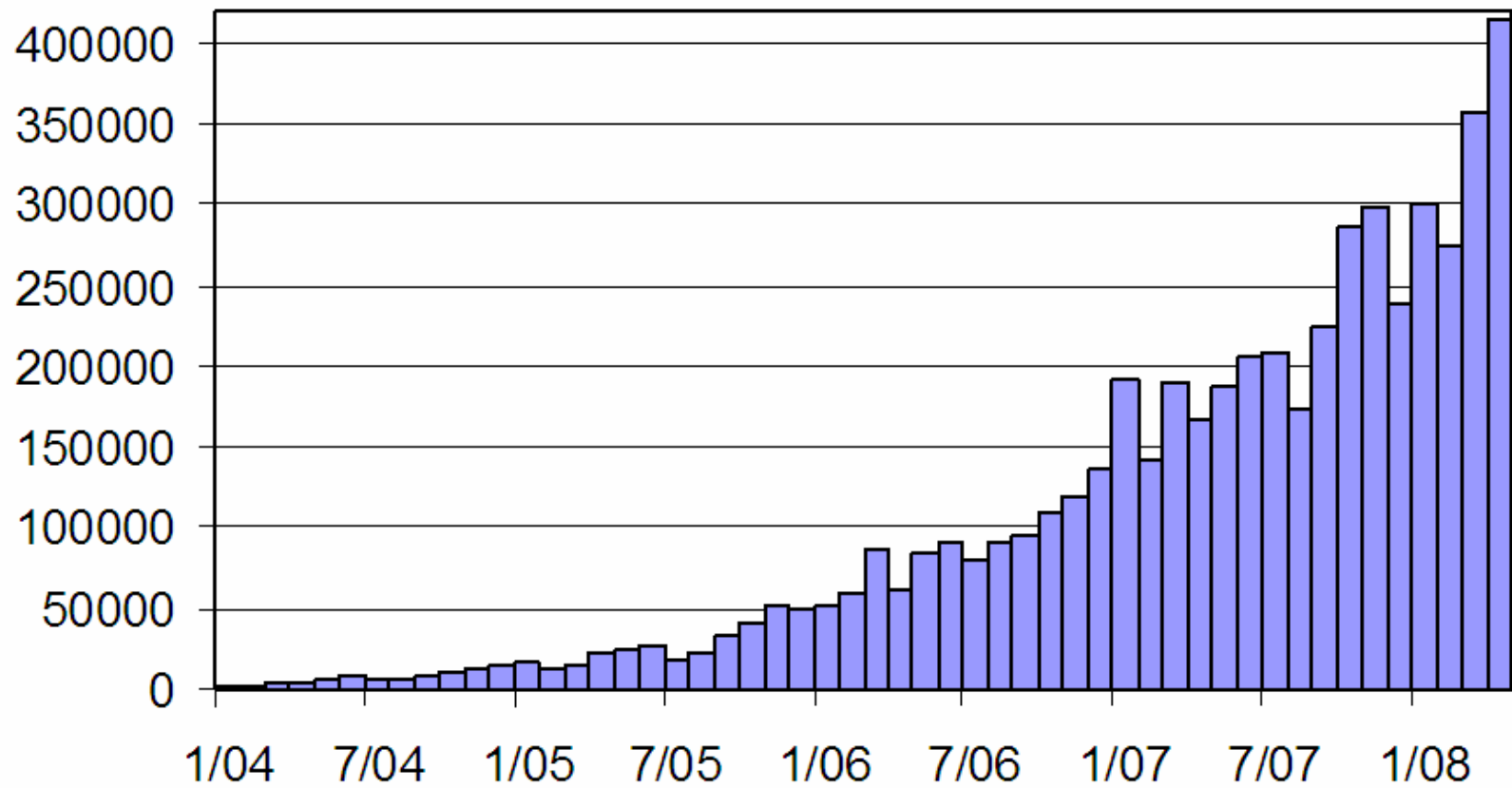


Overview

- International GeoGebra Institute
- Examples of research
- Ideas for future research and activities

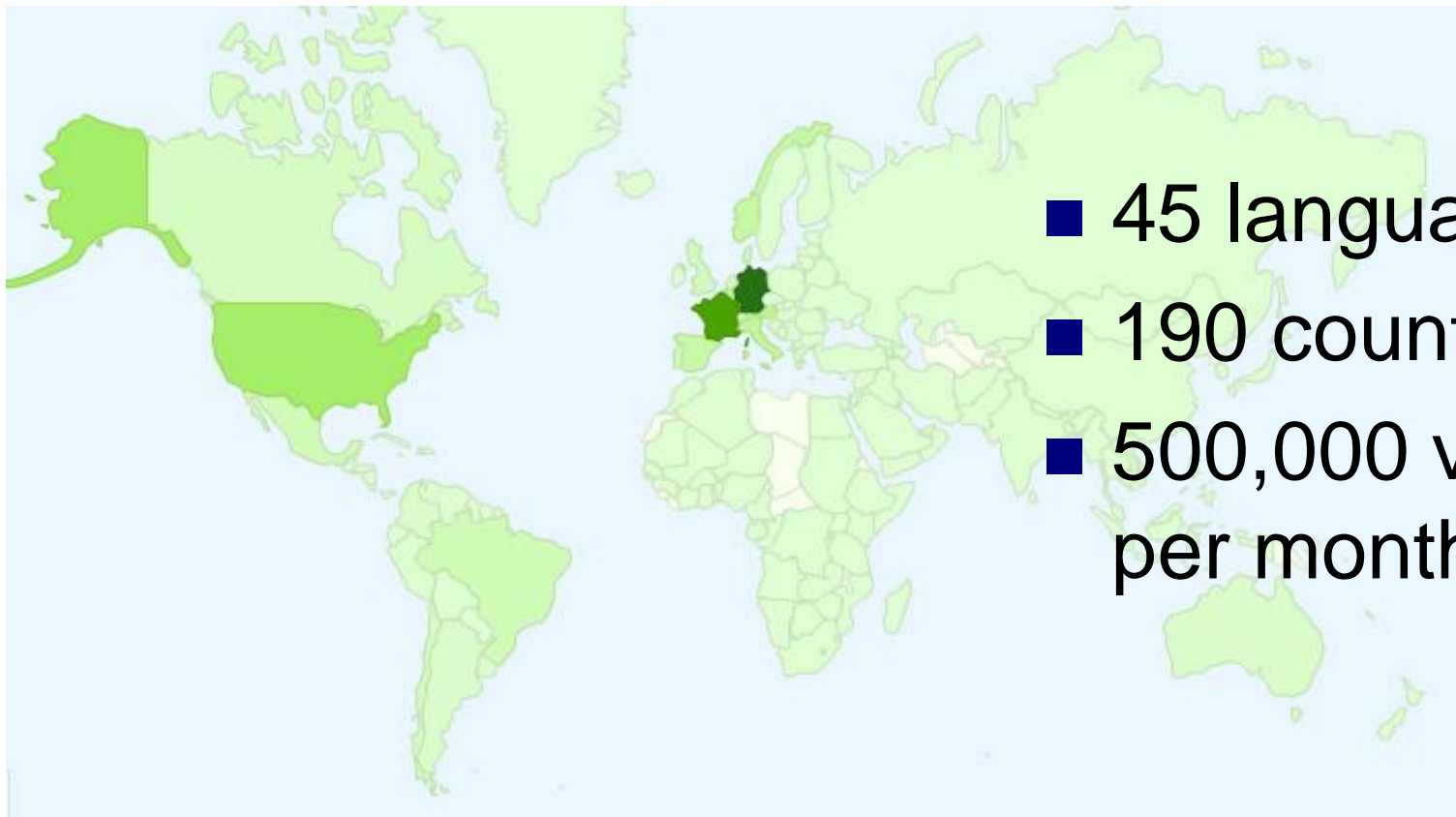


Visitors on www.geogebra.org





World Wide User Community



- 45 languages
- 190 countries
- 500,000 visitors per month



Status Quo

■ What's there?

- Free software and material
- Extensive user community
- Immense expertise developed by enthusiasts

■ What's missing?

- Not enough training
- Not enough support for teachers new to technology
- Limited research on the impact of GeoGebra



International **GeoGebra Institute**

Dec 2007



Core Aims of IGI

- Teacher training and support
 - Offer workshops & support
- Material and software development
 - Share free materials
- Research
 - Encourage and coordinate collaborative research



GeoGebra Certifications

- **GeoGebra Users:** effective use in own classroom
- **Creative GeoGebra Users:** create and share innovative teaching; provide support and workshops in own schools or districts
- **GeoGebra Trainers:** carry out practitioner research on innovative practices; deliver results in own country
- **GeoGebra Institute Trainers:** highly experienced GeoGebra presenters, trainers, and researches; provide support and offer training for IGI participants



IGI

- IGI is virtual organization with GeoGebra Institute sites
- Based on Cambridge meeting in May 2008
 - Discussion document: <http://www.geogebra.org/igi/>
- Application by
 - declaration of aims
 - description of participants
 - Locating/permitting institutes
- Yearly report on local activities



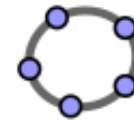
Current and Planned Institutes

- Austria
- Brazil
- Denmark
- Hungary
- Norway
- Poland
- Portugal
- Spain
- United Kingdom
- United States
- Turkey
- Australia
- Canada
- Costa Rica
- Cyprus
- Egypt
- New Zealand
- Philippines
- South Africa
- Serbia
- Slovakia
- Sweden
- Taiwan



Website: www.geogebra.org/IGI

International GeoGebra Institute (IGI)



In IGI, teachers and researchers from all over the world work together to promote the learning and teaching of mathematics by supporting and coordinating the following activities:

- ♦ develop free [GeoGebra](#) workshop materials,
- ♦ offer workshops for teachers and future GeoGebra trainers,
- ♦ further develop GeoGebra and implement new features of the software,
- ♦ develop an on-line support system for teachers,
- ♦ evaluate and improve the professional development activities and materials,
- ♦ design and implement research projects both on GeoGebra and IGI, and
- ♦ deliver presentations at national and international conferences.

Conferences

- ♦ May 7-8, 2008: [IGI Meeting Cambridge](#)
- ♦ July 14-15, 2009: GeoGebra Conference, Hagenberg, Austria

GeoGebra Book - Call for Chapter Proposals

Abstract Deadline: **August 31, 2008**

Title: *Model-centered Learning with GeoGebra: Theory and Practice in Mathematics Education*

- ♦ [Flier about GeoGebra Book](#)
- ♦ [Information for Chapter Authors](#)



Rethinking IGI

- Quick expansion of Local Institutes
- Diversity
 - in locality
 - In legality
- Retain flexibility of local groups
- Keep in mind its aims and community formation
- Main aim of Working Group F and its continuation



Examples of **GeoGebra Research**



Research

- Important part in the aims IGI
- Evidence for improvement
 - Software development
 - Training
 - Teaching and learning
 - User community
- Theoretical basis
- Credibility for our work



Examples of research

- Establishing a professional development network with an open-source dynamic mathematics software – GeoGebra, England
- GeoGebraPrim, Luxembourg
- Interactive Whiteboards and GeoGebra, Hungary



Aims of NCETM project

- Find out together with teachers how GeoGebra can fit into the English curriculum
- Develop and evaluate professional development activities and materials
- Establish a network of GeoGebra experts who can lead activities in England
- Engage teachers in research and evaluate their own work
- Encourage teachers to present at conferences and write professional/research papers



NCETM project

- Participants
 - Teachers with GeoGebra knowledge
 - 9 teachers from different part of England
- Work on different levels and topics of GeoGebra
- Collaborative activities and sharing with the community (local Wiki)
- Offer support and professional development (12 workshops) for teachers in England



NCETM project

■ Theoretical framework

- Utilising experiences from the LCM and ICTML projects in Norway by Barbara Jaworski and Anne Berit Fuglestad (Adger University, Norway)
- Utilising communities of practice research and activity theory
- Tight collaboration of teachers and researchers (didacticicians)



NCETM project

- Data collection (together with teachers)
 - Collecting a pool of GeoGebra materials from participant teachers
 - Videotape meetings and workshops
 - Interview participants
 - Workshop feedback questionnaire
- Analysis/Outcome (together with teachers)
 - Identify topics/levels in the English curriculum
 - Incorporate ideas from teachers into development (PD and software)



Aims of GeoGebraPrim project

- Use of GeoGebra(Prim) in primary school
 - Improve children's understanding of the basic geometric concepts
 - Deeper insight in the bond of geometry and algebra
- Integrate GeoGebra(Prim) into the computer based testing platform (TAO)
- Simplification of the user interface for primary school use



GeoGebraPrim project

- Pre-/post-test study (1 year)
combined with observations of children
- Experimental group
 - 55 children of 9 years
 - Mixed GeoGebra and traditional (paper and pencil) geometry activities
- Control group
 - 55 children of 9 years
 - traditional (paper and pencil) geometry course



Aims of the Interactive Whiteboard Project

- Explore opportunities for the use of GeoGebra with IWB
- Develop GeoGebra+IWB materials
- Offer GeoGebra+IWB professional development for teachers
- Recommend IWB-friendly features/modules for GeoGebra



GeoGebra+IWB project

- Workshops at conferences and in schools
- Questionnaires of GeoGebra+IWB use
- Interviews with teachers
- Follow/observe/videotape teachers using GeoGebra+IWB
- Collate GeoGebra+IWB materials
- Interview students



Theory: GeoGebra book chapters

- Model-Centered Learning and Instruction Using GeoGebra: Theoretical Foundations
- GeoGebra: From Simulation to Mathematization in Teacher Preparation and Inservice Programs
- Using Dynamic Geometry to Bring the Real World into the Classroom
- Mathematics attitudes in computerized environments: A proposal using GeoGebra
- Influence of Geogebra on Problem Solving Strategies
- Using GeoGebra in and out of the high school classroom



Ideas for **Future Research and Activities**



Research priorities?

- Teacher research (PD, teaching practices)
- Research on existing materials (WIKI, workshops)
- Software development/improvement
- Community research (WIKI, forum, local groups)
- Student research (understanding, learning)
- Open-source research (availability, accessibility)
- Other?



Collaboration and activities

- Share experiences/results with colleagues and at meetings/conferences
- Engage research students
 - Bachelor, masters, PhD thesis
 - Research assistants
 - Fellowships
- Write up and publish work/results (practitioner/ research journals)
- Reach out to developing countries and disadvantaged communities



Research support

- Experienced colleagues can
 - Help with research design and analysis
 - Writing funding applications and publications
 - Organise research methods workshops
- IGI aims to offer research support
 - Administrative
 - Workshops
 - Consultations
 - (aim for funding)



Funding, meetings, publications

■ Funding

- Local funding: workshops/meetings/research
- International funding: EU/International/reach out

■ GeoGebra Conferences

- Meetings/working groups in existing conferences
- Specialised meetings and workshops
- Local/General conferences

■ Publications

- Research and practitioner journals
- Journal special issues
- Books/textbooks
- Blogs/on-line journals...



Find out together how to
build and support the
GeoGebra community
and assist mathematics
teaching and learning



THANK YOU!

QUESTIONS?