

# GeoGebra elearning lab

#### Palmira Ronchi - Ada Sargenti

Bari, 10 Luglio 2013 – ICTMT11





GeoGebra Institute of Torino





### A close working relationship

Equal standards in Geogebra certification

GeoGebra

Institute

of Torino

Shared research background in teacher training.  $\bigcirc$ 



## **GeoGebra Institute of Turin**

Chair Ornella Robutti
Mathematics Department of University of Turin

Partner: Social Promotion Association
 La Casa degli Insegnanti (*The Teachers' House*)
 Ada Sargenti
 Responsible for the GeoGebra activities





### GeoGebra Institute of Torino

On the Geogebra logo the city of Turin is represented by the Mole Antonelliana one of the city's major landmarks.



Mole Antonelliana – Turin (Italy)



### *Since 2010*

- Training projects and x Protect a Code Shethodologies
  - managed by the Teachers' House
  - also with the contribution of the Province of Turin
- About 250 teachers have been trained over the past three years
- A "cascade" process has thus been generated
- A first publication with rectricis from courses and experimental school activities will be available during GeoGebra day, on October the 4th 2013 in Turin.





# PROJECT

(not only) Training in the use of GeoGebra software

### AND

- Stimulating discussion on the Experimental teaching methodologies that its use requires
- Seminars (integrated into the course)



# COMMUNITY - moodle platforms

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#### The Teachers' House website http://lacasadegliinsegnanti.wizshelf.org/

#### University website DI.FI.MA. (Teaching physics and mathematics) http://teachingdm.unito.it/porteaperte/







# PRACTICE

- Training must not be a moment disconnected from teaching
- Teachers tested GeoGebra in the classroom
   with the guidance of experts
  - for an effective integration of technologies in their activities





### GeoGebra Institute of Bari

# Chair Eleonora Faggiano Mathematics Department - University of Bari

Team members: Rosa Laura Ancona Felice lavernaro Francesca Mazzia Antonella Montone Palmira Ronchi





GeøGebra Institute of Bari

The castle was built about 1240 by Frederick II of Swabian and is well known for its **octagonal shape**.

A CASTLE FULL OF THE GOLDEN NUMBER AND MATHEMATICAL SYMBOLS .



**Castel del Monte** – Andria di Bari (Italy) Castle of the Mount



## *Since 2010*

 Mission: to empower teachers at all levels to use GeoGebra in studentcentered learning, highlighting the pedagogical rather than technical aspects of the software as we firmly believe that teachers should learn how to use technological tools (such as GeoGebra) as a methodological resource.

#### Training project

- Etwinning lab events, online courses for maths teachers on the use of Geogebra in on line twinning projects between European schools involved in the Lifelong Learning Program.
- About 120 European teachers took part in them.
- Design of free teaching and professional development materials, in research projects concerning GeoGebra and IGI, in publications in journals and in presentations at national and international conferences.



### Questions

- Does using Geogebra automatically improve teaching and students' learning?
- What specific teaching methods, strategies or models can be used to organize effective GeoGebra training?
- Above all, is it enough to learn how to use Geogebra without reflecting on the methodologies, contents and objectives of Mathematics teaching?

# GeoGebra elearning lab

Pilot platform GEOGEBRA ELEARNING LAB Sei collegato come Palmira Admin Ronchi, (Esci) evpbari > GG (?) Cambia ruolo in ... Attiva modifica Ultime notizie Persone Indice degli argomenti Cor Carning platform Prossimi eventi NT GEOGEBER 40 TRA NO GEO entary\_middle and Attività recente Attività a partire da lunedi, 17 giugno 2013 03:15 Report completo E Impostazioni dell'attività recenti that 0115 Aggiunto Wiki: **GEOGEBRA WIKI** Disiscrivimi da GG Profilo or (e) Stol SIRIO **INFORMATICA** MATEMATICA SCIENZE

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The implementation of the Geogebra lab was achieved by incorporating the necessary Moodle server software into a dedicated website.

Moodle is a free and open-source e-learning software platform which enables trainers:

• to develop learning materials supported by several tools and plug-ins,

• to keep track of teacher trainees and their achievements,

• to log and evaluate activities.

### "Geogebra elearning lab" events





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### The pilot "Geogebra elearning lab" event SCHEDULE

Tasks duration	Topics from National standard curriculum and International and National student assessments	Some operations of Geogebra from Geogebra certification Guidelines	
1. two days	Geometry	<ul> <li>Installation and introduction of Geogebra Getting started with Geogebra</li> <li>First construction using Geogebra</li> <li>Customizing and simplifying the user interface - User defined tools</li> </ul>	
2. two days 3. two days	Numbers	Basic algebraic input, commands and functions     Inserting static text and pictures into the graphics window     Inserting dynamic text into the graphics window     Creating Dynamic work-session     Export of Pictures to the clipboard or as image file     Free and Dependent Objects	
	Function	- Slider - Graphics' Transformations - Slope - Derivative and Integral Commands	Be unlique case if vacues have faces. And € Constant of the second sec
4. one day	Uncertainty & data	<ul> <li>Spreedsheet View</li> <li>Auxiliary Objects</li> <li>Trace to Spreadsheet</li> <li>List Tools and Analysis Tools</li> </ul>	Constraints of the second
5. one day	Virtual conference session with an expert and creation of a discussion forum.	- Geogebra news and updates - GeoGebra: CAS, 3D, Chrome,	
	Final Questionnaire and end o	of the Geogebra lab event.	





### "GEOGEBRA ELEARNING LAB task

N.	Nome	Icona della barra	Definizione	Valore	Legenda	😥 COMPARATA geb
	1 Funzione f			f(x) = sen(x)		File Modifica Visualizza Opzioni Strumenti Finestra Guida
F	2 Punto A	A	Punto su asseX	A = (-1.89, 0)		
		•``				
	3 Punto P		(x(A)f(x(A)))	P = (-1.89, -0.95)		
F	4 Punto R		(y(P), x(P))	R = (-0.95, -1.89)		10 D Juogo D Juogo
F	5 Luogo luogo1	×	Luogo(R, A)	luogo1 = Luogo[R, A]		p grafico dela cuiva
L		<b>Q</b> ~				(P) yano Cuiva
	6 Valore booleano a			a = false	luogo	B Traccia
	7 Valore booleano d			d = true	traccia	
F	8 Retta e			e:y=x		
F	9 Retta k			k: y= 1		
1	I0 Retta h			h: y = -1		
1	11 Punto Q		(x(A), 1/f(x(A)))	Q = (-1.89, -1.05)		
1	12 Luogo luogo2	<u>x</u>	Luogo[Q, A]	luogo2 = Luogo[Q, A]		
1	13 Valore booleano i			i = false	luogo	
1	14 Funzione g		g(x) = 1 / f(x)	g(x) = 1 / sen(x)		
1	15 Valore booleano j			j = false	grafico della curva	
1	16 Valore booleano I			l = true	traccia	
1	17 Campo di inserimento ca	a-1	CampoInserimento[f]	campoInserimento1	f(x)=	
1	18 Testo testo1	ABC		"INVERSIONE"		
1	19 Testo testo2	АВС		"RECIPROCO"		INVERSIONE
2	20 Curva m		Curva(f(t), t, t, -100, 100]	m:(f(t), t)		
2	21 Valore booleano b			b = false	grafico curva	

The tasks are structured in two parts: a step by step reconstruction of a Geogebra work-session and a challenge concerning the work session topic. In the figure above there is an example of the third task, for secondary school teachers, concerning the inverse and reciprocal functions.

The related challenges are: "Observing the function graphic, which suggestions can be obtained in order to draw its reciprocal function graphic?". "Observing the function graphic, which suggestions can be obtained in order to draw its inverse function graphic?". Is the result still a graphic of a function?





### "GEOGEBRA ELEARNING LAB event How to get a Geogebra certification

In each task trainees do practice in Geogebra construction, save the generated ggb file, answer questions and then <u>send the work session file to the task lab-repository</u>.

After the two online training weeks teachers have a maximum of <u>one month to plan a lesson using</u> <u>Geogebra and to try it out it in the classroom</u>, monitored by an online tutor who provides support both in the planning of the lesson and if there are problems regarding Geogebra.

The teacher may decide to experiment with his own idea or with a suggestion coming from the course activities.

There is no special schedule or exact timeline for this online event, meaning that teachers can work on their sessions and tasks whenever they like. <u>The online tutor will put the next day's sessions and</u> <u>tasks in the last day of the previous session</u>, so that teachers have time to work on them for the whole two days.

<u>To receive the final certificate trainees have to insert their work-files in the dedicated task repository</u> and use the Moodle WIKI until the end of the course – where they have to write a short reflective paper about their experience using Geogebra in their school activities.



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# Thank you for your attention!