Multi-User GeoGebra with Virtual Math Teams

The Math Forum @ Drexel University www.mathforum.org vmt.mathforum.org

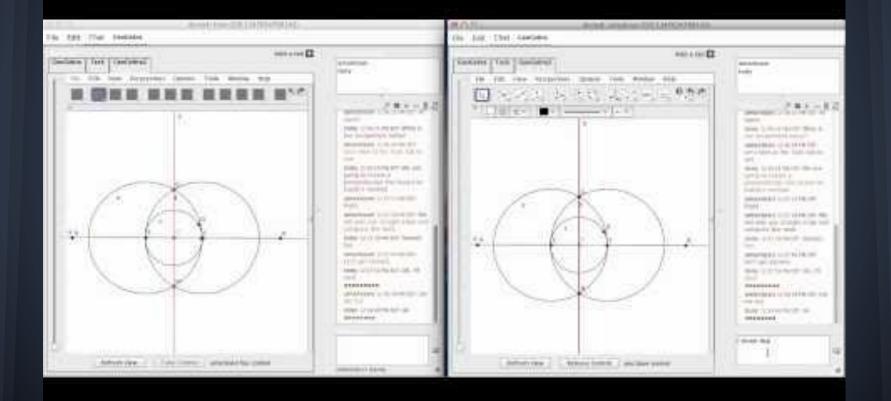
Virtual Math Teams (VMT)

- VMT is an online environment for students to work on and discuss math problems synchronously.
- VMT combines support for dynamic geometry with media for collaborative learning.

Integration with GeoGebra

- Remote students can synchronously work on a shared construction together.
- Users can take turns manipulating the construction.
 - Adding, deleting, modifying and moving objects
- The construction will stay in sync on each user's screen.
- Users can chat about the problem as they work.

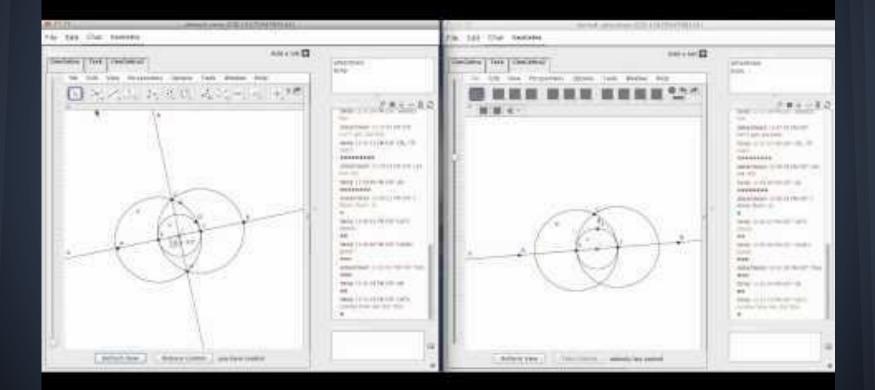
Integration with GeoGebra



History Tracker

- Built in history tracker allows users to scroll back and forth in time to see how the construction developed.
- Shows everything that happened including style changes and object movements.
- Each GeoGebra workspace is tracked separately.

History Tracker In Action



Other Shared Tools

- Shared Whiteboard
 - Users can doodle on the shared whiteboard
 - Draw simple shapes
 - Summarize work, draft shared statements, note observations or hypotheses in text boxes
 - History of the whiteboard is also tracked.

Web browser

- Simple web browser
- Can be used to show instructions for the student's assignments or other related information on the web.

VMT has built in tools for session analysis

- VMT records every chat, and action in the session.
- Provides a session replayer to go back and forth through the session step by step.
- Chat, whiteboard, and GeoGebra events all playback in the order they occurred in the original session.

The VMT Session Replayer

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VMT has built in tools for session analysis

- Spreadsheet log files can be downloaded for each VMT room.
- Log files and the VMT Replayer provide unique insights for teachers and researchers.
- Allows teachers to go back and see anything they missed during class.

Session Log Files

	Α	В	С	D	E	F	G	Н		
1	Line	Date	Start Time			EventType	tony	amantoan		
2	1	09/06/2012		10:38:42	00:00:00	chat	joins the room			
3	2	09/06/2012		10:39:54	0:1:12	chat		joins the room		
4	3	09/06/2012		11:24:49	0:44:55	chat	Hello			
5	4	09/06/2012		11:25:07	0:0:18	chat		Hi. Lets start by looking at the task description.		
6	5	09/06/2012		11:25:11	0:0:4	chat	Ok.			
7	6	09/06/2012		11:25:31	0:0:20	chat	Alright, I'll start.			
8		09/06/2012		11:25:42	0:0:11	Geogebra:GeoGebra	added point:Point "A"			
9		09/06/2012		11:25:44	0:0:2	Geogebra:GeoGebra	added point:Point "B"			
10		09/06/2012		11:25:44	0:0:0	Geogebra:GeoGebra	added line:Line "a"			
11		09/06/2012		11:25:50	0:0:6	Geogebra:GeoGebra	added point:Point "C"			
12		09/06/2012		11:25:52	0:0:2	Geogebra:GeoGebra	added point:Point "D"			
13		09/06/2012		11:25:52	0:0:0	Geogebra:GeoGebra	added conic:Circle "c"			
14		09/06/2012		11:26:01	0:0:9	Geogebra:GeoGebra	added point:Point "E"			
15		09/06/2012		11:26:02	0:0:1	Geogebra:GeoGebra	added point:Point "F"			
16	7	09/06/2012		11:26:18	0:0:16	chat		Great, I'll take it from here.		
17		09/06/2012		11:26:29	0:0:11	Geogebra:GeoGebra		added conic:Circle "d"		
18		09/06/2012		11:26:33	0:0:4	Geogebra:GeoGebra		added conic:Circle "e"		
19		09/06/2012		11:26:40	0:0:7	Geogebra:GeoGebra		added point:Point "G"		
20		09/06/2012		11:26:43	0:0:3	Geogebra:GeoGebra		added point:Point "H"		
21		09/06/2012		11:26:52	0:0:9	Geogebra:GeoGebra		added line:Line "b"		
22	8	09/06/2012		11:27:00	0:0:8	chat		That;s it.		
23	9	09/06/2012		11:27:04	0:0:4	chat	Lets check.			
24		09/06/2012		11:27:15	0:0:11	Geogebra:GeoGebra	added angle: Angle "?"			
25	10	09/06/2012		11:27:21	0:0:6	chat	Looks good.			
26										
27 () () () () () () () () () () () () () (

Classroom Materials Available

- The VMT research team has developed materials specifically for collaborative use of GeoGebra.
- Developed by leading researchers in Computer Supported Collaborative Learning (CSCL) at Drexel University
- http://GerryStahl.net/vmt/activities.pdf

VMT Is Publicly Available

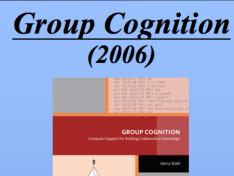
- VMT is open source.
- Our Math Forum VMT server is available for all to use - vmt.mathforum.org
- Anyone may set up their own VMT server.

For More Info

- Tony Mantoan, lead VMT software developer
- Steve Weimar, director of the Math Forum
- Gerry Stahl, PI of the VMT research project

tony@mathforum.org steve@mathforum.org gerry@mathforum.org

The Virtual Math Teams Trilogy



<u>Computer Support for Building</u> Collaborative Knowledge

MIT Press, 510 pages Available for Kindle

The theory of group cognition emerges from several studies of CSCL and CSCW technologies. Analysis of interaction. Theory of CSCL.

www.GerryStahl.net/elibrary/gc



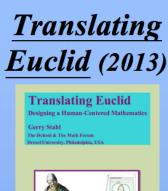
Studying Virtual Math Teams (2009)



Springer Press, 626 pages CSCL Book Series, paperback

Studies of the VMT Project technology, pedagogy, analysis, theory by team members and international collaborators

www.GerryStahl.net/elibrary/svmt





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