



# Working group

## CADG TOOLS, TEACHING AND LEARNING

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This working group welcomes contributions connected to the practitioners' and researchers' opinions on the direction in which CADG tools (especially software) should develop. Some topics and questions:

- **One tool covering all aspects of teaching and learning mathematics, or many "smaller" tools**  
It seems that with time all software intended to be used as a math teaching tool acquires more and more features. Developers often claim users demand those new features, and also some teachers claim it is best to stay in the same environment all the time. But is that really the case? Is not part of the teaching process equipping students with the knowledge of how to pick the right tools for a particular task? Aren't smaller tools often more flexible and versatile? However, how does one then switch the result between the tools?
- **How powerful should tools be when they are considered to be teaching tools**  
When a certain tool is meant as a teaching tool – should its capability be limited to the level of math knowledge of the students? Or should the students be exposed to "real life" tools without limitations. What about the possibility of posing limitations to and "fine tuning" the tools' capability?
- Are age-appropriate versions for students beneficial or should we stick to one version  
In most cases that means some adjustments to the menu system or the interface, but the way of using the tool stays completely the same. What are the benefits and what are the drawbacks when we have such special versions of the same tool for students at various levels?
- **Options for personalization of working environment in software tools**  
Quite often it is impossible to adjust the working environment to the students' needs. In some cases the developers offer a few predefined modes. As well as that, software often lacks the possibility to easily store, copy and switch between those personalized settings.
- **Support materials development and usage**  
What are the best ways of developing support materials? What should be the role of the public? Are wikis the best possible mode? How to regulate the responsibility and divide the work between the developers and the public? What about the translation process? Should examples of "real-life use" be provided alongside the explanation of all commands ...
- **Openness of construction process**  
For example: is the way GeoGebra offers the possibility to see the construction steps the best possible one? What about the "intermediate steps" such as hiding certain objects or changing the properties which are not recorded ...
- **Interoperability of tools**  
When we would like to solve a certain task where at each step a different tool is used – how do we switch the results between the tools? Is it possible to clearly define a math object's specification that would support such interoperability?
- ...

This working group would like to discuss and then propose the requests and ideas to software developers.