

## GeoGebra at Havering Sixth Form College

I am essentially a classroom practitioner, with very little academic research experience, so what follows is a description of my experience of using GeoGebra to date, with some indication of the directions I would like to pursue in future.

I work in a large sixth form college, with students aged 16-19. About 450 students are studying A Level Mathematics, and will progress to university to study a range of subjects, some of which may be maths-related; about 50 are studying A Level Further Mathematics, and many of these will study mathematics at university. There is a small group of IB Diploma students. We also have about 200 students who have to continue studying mathematics because they have not yet reached the government required level of attainment; these are generally weak at mathematics and/or poorly.

We have 11 mathematics teachers. All are aware of GeoGebra and its possibilities; most will use resources produced by others in their teaching, usually for demonstration. Three of us make extensive use of GeoGebra in demonstration mode, mostly for topics in pure maths, although one of us often uses GeoGebra in his mechanics classes. There is some use of dynamic worksheets, which are on our VLE, Moodle. Occasionally students use GeoGebra itself.

I have been involved, with a colleague, in the NCETM project in the UK. We have run a workshop for our colleagues, so that they can use GeoGebra at a basic level and give support as needed. We hope to extend this PD to help teachers in our partner schools in our LEA. I have visited a partner school to observe another teacher using GeoGebra with her students.

I am a regular user of the GeoGebra forum; being able to use some French, Spanish and a very small amount of German, I have gained expertise from colleagues across the world. The IB is an international qualification, requiring students to have an international understanding, so I am interested in increasing international collaboration and comparing maths curricula and methods.

I have used GeoGebra for many of the Pure Maths topics studied in the UK at A level – mostly graphing and functions. I have found it particularly helpful for graphing polar equations and trigonometric functions. I want to develop resources on numerical methods and modelling and to use the spreadsheet facility. I can foresee a need to be able to use Javascript and LaTeX.

I am keen to develop ideas to get students using GeoGebra for themselves, in the classroom and independently, both to investigate topics in mathematics, but also as a tool, in the same way as they could use a graphic calculator. I hope that the IB students will use GeoGebra extensively in their 'Internal Assessments', for which the assessment criteria require the use of technology. I would like to use it more with the lower level courses, particularly the geometry and statistics features.

One wish would be to be able to use implicit functions in GeoGebra. But my main desire is to use GeoGebra to give a 'WOW!' factor to lessons – when students speedily make interesting and unexpected discoveries, so they can then ask the harder-to-answer 'Why?' and 'What if...?' type questions, leading to conjecture, proof and higher order thinking skills.