

DYNAMIC GEOMETRY AND PROBLEM SOLVING STRATEGIES

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The focus of this paper is on students' problem solving and posing processes in the learning environment of dynamic geometry. In my case-study I consider how Dynamic Geometry Systems may mediate students' problem solving strategies. I will report on a session where a mathematical problem was presented for prospective mathematics teachers with prior experience in using dynamic geometry. I compare the analytic-approach and the DGS-approach and I confirm the premise that with technology we do the job differently.

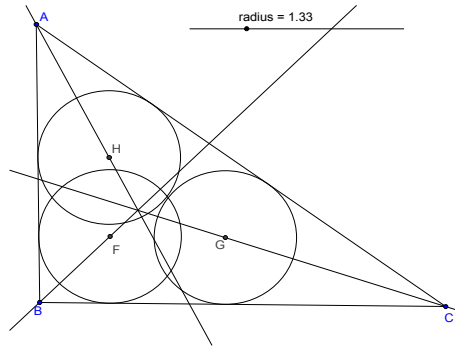
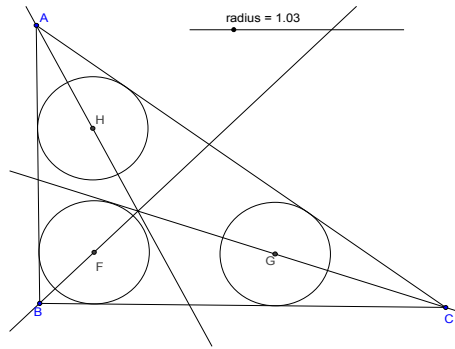
THE PROBLEM AND DIFFERENT APPROACHES: A CASE STUDY

I proposed the problem in rather open form: *Cut two congruent circles from a triangle such that their area is maximal.*

When students work with paper and pencil, they naturally *draw* a picture with the triangle and with two circles in the appropriate tangent position. (*Draw a figure.* - Pólya.) This figure leads to the analytic solution.

However when you try to make a figure with an interactive geometry software you simply can not draw the imaginary solution. Follow Pólya's next principle: *Separate the various parts of the condition.* You can construct circles which are tangent to two sides of the triangle but which are not osculant to each other. One condition failed and students constructed three circles with the same radius. Varying the radius of the circles the picture leads to the dynamic solution.

The results of the study also show that DGS helps students to use of experimenting, conjecturing and generalising in the problem solving processes.



REFERENCES

Santos-Trigo, M. and Diaz-Barriga, E. (2000). Sharing teaching ideas. Posing questions from proposed problems: Using technology to enhance mathematical problem solving. *Mathematics Teacher*, 93(7), 578-580.