GSP AND DYNAMIC GEOMETRY SOFTWARE

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GSP and Learning

- Dynamic geometry software (DGS) – Geometer's Sketchpad (GSP) and Cabri
- Continuous real-time transformation "dragging"
- Potential to change the way we teach and learn geometry

Features in DSG

- From static and deductive activity to exploratory and inductive activity in the nature of mathematics

- Underlying relationships in understanding the notion of "figure" rather than the particulars of a specific drawing (Goldenberg and Cuoco, 1998)

- Graphical possibilities of software for a reification of abstract objects (Laborde, 1998)

- Visualization as a key component of problem solving (Arcavi, 2003)

- Visual strategy can change the whole gestalt into a new one in which patterns seem easier in problem solving (Arcavi, 2003)

Features in DSG

- Reasoning can be seen to make sense of the processes of exploring, conjecturing, and arguing as a way of arriving at a valid proof (Hanna, 2000)

- The potential for changing the beliefs of teachers about how geometry is learned and their behavior in the classroom

Some Issues in DSG

- ☑ How we can promote the teaching of deductive reasoning in DSG environments?

- ☑ How students interpret what they see and what are potential hazards and pitfalls of reliance on DGS? (Goldenberg and Cuoco, 1998)

- ☑ How to convey the interplay of deduction and experimentation and the relationship between mathematics and the real world? (Hanna, 2000)

Examples in GSP

- Domain and range:
- Geometric mean:
- Inscribed angle:
- Slope:
- Phone bills:
- Linear, quadratic, and cubic functions:
- Parabola in vertex form:
- Parabola:
- Cubic functions factored:
- Trigonometric functions: sine, all

Reference

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- Arcavi, A. (2003). The role of visual representations in the learning of mathematics. *Educational Studies in Mathematics, 52,* 215-241.

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