

Hand-Held Calculators –

What Should the Boulder Valley School District Do?

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(1) Develop a principled argument for the chosen recommendation

I will choose the 3rd option: invent/create new calculators, new curricula, new scaffolding mechanisms that make learning these skills more fun and create a deeper understanding of underlying concepts — recommendation: using these hand-held calculators, the learners would acquire the skills and the knowledge and eventually become independent of the gadget (“scaffolding with fading”)

the National Council of Teachers of Mathematics ((NCTM) takes the position that calculators can and should be used in all mathematics classrooms, as long as they are implemented properly. “Appropriate instruction that includes calculators can extend students’ understanding of mathematics and will allow all students access to rich problem-solving experiences.” (NCTM, 2000)

NCTM published a position statement that speaks to the use of calculators in the education of the nation’s children. “The NCTM recommends the integration of calculators into the school mathematics program at all grade levels.” The committee goes on to explain the rationale behind their position: “Research and experience support the potential for appropriate use to enhance the learning and teaching of mathematics. Calculator use has been shown to enhance cognitive gains in areas that include number sense, conceptual development, and visualization.”

The committee recommends that all students should have access to calculators. They state that all mathematics teachers should promote the use of this technology and that they should keep up with new skills by participating in professional development activities that are encouraged by the school district. (Resource: “The Calculator in the Elementary Classroom: Making a Useful Tool out of an Ineffective Crutch”, Erin McCauliff, Department of Education and Human Services, Villanova University)

(2) Discuss the major weakness of the other choices

I believe whether to ignore the existence of the gadget (position 1) or to use technology in a conservative way (position 2) violates the verve of education. With new technologies, new cognitive possibilities arise. The proliferation of digital technologies requires a concerted effort to envision activities that enable students to engage in more complex problem domains (http://www.henryjenkins.org/2006/10/confronting_the_challenges_of_4.html). For position 4, I don’t agree with the labor division, which infers that to allocate qualitative reasoning to humans and machines can only do quantitative computations.

(3) Relate my argumentation to the assigned article(s)

In the paper “Tools for Living and Tools for Learning”, it categorizes “hand calculator” as a tool for living and an external artifact that supports distributed intelligence. According to another paper, a traditional hand-held calculator also belongs to general distributed intelligence without fading. My choice of option 3 intends to augment a traditional calculator to a new media – a gadget of “scaffolding with fading” – it seems to me a very fun area.