

The following table compares some unproductive and productive beliefs that influence the implementation of classroom tools and technology. It is important to note that these beliefs should not be viewed as good or bad, but rather as productive when they support effective teaching and learning or unproductive when they limit student access to important mathematics content and practices.

| Beliefs about tools and technology in learning mathematics | |
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| Unproductive beliefs | Productive beliefs |
| Calculators and other tools are at best a frill or distraction and at worst a crutch that keeps students from learning mathematics. Students should use these tools only after they have learned how to do procedures with paper and pencil. | Technology is an inescapable fact of life in the world in which we live and should be embraced as a powerful tool for doing mathematics. Using technology can assist students in visualizing and understanding important mathematical concepts and support students’ mathematical reasoning and problem solving. |
| School mathematics is static. What students need to know about mathematics is unchanged (or maybe even threatened) by the presence of technology. | Technology and other tools not only change how to teach but also affect what can be taught. They can assist students in investigating mathematical ideas and problems that might otherwise be too difficult or time-consuming to explore. |
| Physical and virtual manipulatives should be used only with very young children who need visuals and opportunities to explore by moving objects. | Students at all grade levels can benefit from the use of physical and virtual manipulative materials to provide visual models of a range of mathematical ideas. |
| Technology should be used primarily as a quick way to get correct answers to computations. | Finding answers to a mathematical computation is not sufficient. Students need to understand whether an answer is reasonable and how the results apply to a given context. They also need to be able to consider the relative usefulness of a range of tools in particular contexts. |
| Only select individuals, such as the most advanced students or students who reside in districts that choose technology as a budgetary priority, should have access to technology and tools, since these are optional supplements to mathematics learning. | All students should have access to technology and other tools that support the teaching and learning of mathematics. |
| Using technology and other tools to teach is easy. Just launch the app or website, or hand out the manipulatives, and let the students work on their own. | Effective use of technology and other tools requires careful planning. Teachers need appropriate professional development to learn how to use them effectively. |