

TECHNOLOGICAL ENVIRONMENTS

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- What algebraic insights and ‘symbol sense’ does the user of a computer algebra system need and what insights does the use of the systems bring?
- A strength of computer algebra systems is that they support multiple representations of mathematical concepts. How can this be used well? Might it be over-used?
- What are the relationships and interactions between different approaches and philosophies of mathematics teaching with the use of computer algebra systems?
- Students using different computational tools solve problems and think about concepts differently. Teachers have more options for how they teach. What impact does this have on teaching and learning? Which types of system support which kinds of learning? Can these differences be characterised theoretically?
- What should an algebra curriculum look like in a country where computer algebra systems are freely available? What ‘by hand’ skills should be retained?

TECHNOLOGICAL ENVIRONMENTS

Recent research, curriculum development, and classroom practice have incorporated a number of technologies to help students develop meaning for various algebraic objects, ideas and processes. These include, but are not limited to, function graphers, spreadsheets, programming languages, one-line programming on calculators, and other specific computer software environments. [Here, we exclude computer algebra systems that are treated elsewhere.] In an attempt to characterise recent research and experience, this section will explore which aspects of specific computer/calculator environments are related to which kinds of algebra learning. This question will be explored in depth for specific examples of such technology, by addressing questions such as the following:

- For a given technological environment, what are the implicit assumptions regarding the underlying core aspects of algebra?
- Which important aspects of algebra are and are not touched upon by this environment?
- What kinds of algebra learning does this environment promote?
- What particular limitations are associated with the use of this environment and how can such limitations be dealt with?
- To what extent ought the goals of algebra education be affected by the availability of this technology?
- To which aspects of algebra learning does this particular technology make a distinctive, unique contribution?
- Are there documented long-term consequences of embedding this particular technology in an algebra curriculum, and if so, what are they?

Submissions for this section should include discussion of as many of the above sub-questions as possible, but with particular attention paid to the first two items above.