

Technology in Teaching Mathematics: Looking Back and Looking Forward

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The students we now have in 2014 were almost born with technology in their hands. Numerical and graphical calculators are accepted tools on every student's desk. But they also have smartphones, tablets, ipads, with even more powerful apps, always at their sides. How does this change math education? What can we still expect them to be able to do "by hand" and where will they need technology to support them? Have we gained something while encouraging them to use all these tools?

We will show examples of math calculations that used to be done manually 30 or 40 years ago and that are accepted today as being done via technology. Today's students will smile if we attempt to explain that these calculations used to require a lot of time and paper. Looking at the way technology has evolved in the last 15 years, we believe we should be asking ourselves which math operations will make students smile in 30 years from now, thinking of how we did these calculations in 2014. Since numerical calculations are now mainly done with technology, we need to consider which level of algebra students really need to acquire, since calculators, apps and software can do more and more of these operations for them. Computer Algebra Systems (CAS) are easily available. Shouldn't we be showing them how to better use this technology? To be aware of its limits and caveats. Examples will be presented to illustrate this.

At our university, all engineering students are required to have a CAS calculator. This has been mandatory now for 15 years. We will discuss how this has changed the way we teach some of our topics and show examples of how technology has allowed us to continue to cover the same general curriculum, discarding some manual calculations and having students explore and work even more mathematics or more challenging problems. We will also present how students themselves evaluate this technology in their learning environment and how good they consider their teachers are in teaching and using this CAS environment in the classrooms.