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Do we take advantage of ICT when teaching maths at primary and secondary education levels? Do we teach maths as we should?

Eugenio Roanes-Lozano[1]

My son is finishing primary education and I consider many of the school activities he has undertaken a waste of time. For example, does it make sense to divide by hand a twelve-digit number by a seven-digit number, or to factorize by hand an integer, two of whose factors are 71 and 107?

Although these are very specific cases, the exercises proposed in math classes at the primary and secondary education levels are not usually interesting, are sometimes even tedious and do not make the student love but hate maths. For example, in the case of factoring a number, the key is to understand what is being done and to know how to do it (algorithm), but it makes no sense to resolve uncomfortable cases when powerful computer algebra systems (CAS) are available in computers, calculators and even smartphones. In addition, the exercises proposed are many times disconnected from the real world (unlike many of those proposed in tests such as Pisa).

The use of ICT (at least in Spain) is many times restricted to "doing some research" on certain specific topics, but this is often a euphemism, since what the student many times does is just a "Google search".

Almost twenty years ago a secondary schoolmate asked me which software to use, since the computers of his school had only the operating system and an office package and there were no funds for software. My answer was taxative: the CAS Maxima and the (then new) dynamic geometry system (DGS) GeoGebra. GeoGebra has spread considerably at secondary education level (overshadowing the pioneers Cabri Géomètre and The Geometer's Sketchpad and the other DGS), but no CAS has clearly spread at this level. Possibly, the use of the latter has even decreased at this level for two reasons:

- Derive being discontinued
- the incorporation of algebraic capabilities by GeoGebra.

Despite the fact that since the 90s different theories have been developed about the use of mathematical software in education, such as the "Black Box / Whyte Box Principle" [1,2] and the "Mathematical Creativity Spiral" [3] (Buchberger), the "Scaffolding Principle" [4] (Kutzler) or the "Elevator Principle" [5] (Cabezas and Roanes), the teaching of primary and secondary education level mathematics continues to have a very low level of experimentality and the intensive use of mathematical software in the classes is exceptional.

Which can be the reasons for the limited use of ICT in the math classes and the persistence of tedious activities?

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[1]Instituto de Matemática Interdisciplinar &
Depto. de Álgebra, Geometría y Topología
Facultad de Educación, Universidad Complutense de Madrid
c/ Rector Royo Villanova s/n, 28040-Madrid, Spain
eroanes@mat.ucm.es