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On the importance of combining new and old mathematical ideas

Addressing the question whether or not "mathematics in 1999 looks like mathematics in 1939" when it comes to its teaching, I discuss situations when I would rather have an affirmative answer. Namely, I prefer to see our students being equipped with some ideas stressed in mathematics curriculum a century ago but diminishing now.

My concern is that many students graduating from universities today are familiar with formal algorithmic procedures to solve mathematical problems while they are often unable to explain and justify them or connect them to more intuitive constructions because the students were never exposed to these ideas.

I give examples illustrating that some old, elementary, yet insightful mathematical methods and facts remain effectively concealed from students studying mathematics today. I argue that while it is important for students to know modern approaches, their education should also include experiences highlighting preceding ideas related to these advanced methods. Building on a proper combination of modern and old ideas is essential for students to develop flexible thinking and use mathematics for modeling real life phenomena. Otherwise, they will tend to stick to procedural techniques and will not fully appreciate the results of modern approaches because of lost connections to old but enlightening mathematics.