
DANIEL MCQUILLAN, Norwich University

Please reveal the beauty—do not hide the beauty—of the best theorems of calculus!

Part I of the Fundamental Theorem of Calculus is a beautiful theorem—yet most of our students do not see it as a spectacular achievement of human imagination. This is due to the fact that almost every introductory course postpones its treatment until after students have been misled to believe that calculus consists primarily of rules for calculating derivatives and anti-derivatives.

This talk is a plea for returning to the once universally accepted axiom that learning is improved when students are offered a deep understanding of the material that they are supposed to master; that language makes more sense when we know what the words mean and that geometric facts become clear when we can look at the right picture. We focus on slight changes to a standard calculus course that introduce the Fundamental Theorem of Calculus early and often, resulting in the communication of its essential meaning. This summarizes work with Darlene Olsen* and Rob Poodiack** at Norwich University, as well as many years of experimenting with calculus teaching going back to last century.

*A Truly Beautiful Theorem: Demonstrating the Magnificence of the Fundamental Theorem of Calculus, D. McQuillan and D. Olsen, *Journal of Humanistic Mathematics*, Vol. 6, No 2, July 2016, pp. 148-160.

**On the Differentiation Formulae for Sine, Tangent and Inverse Tangent, D. McQuillan and R. Poodiack, *College Mathematics Journal*, Vol. 45, No. 2, March 2014, pp. 140-142.