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**Generating the patterns of variation with GeoGebra: the case of polynomial approximations.**

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Summary: In this paper, we report a teaching experiment regarding the theory of polynomial approximations at the university mathematics teaching in Sweden. The experiment was designed by applying Variation theory and by using the free dynamic mathematics software GeoGebra. The aim of this study was to investigate if the technology-assisted teaching of Taylor polynomials compared with traditional way of work at the university level can support the teaching and learning of mathematical concepts and ideas. An engineering student group ( $n = 19$ ) was taught Taylor polynomials with the assistance of GeoGebra while a control group ( $n = 18$ ) was taught in a traditional way. The data were gathered by video recording of the lectures, by doing a post-test concerning Taylor polynomials in both groups and by giving one question regarding Taylor polynomials at the final exam for the course in Real Analysis in one variable. In the analysis of the lectures, we found Variation theory combined with GeoGebra to be a potentially powerful tool for revealing some critical aspects of Taylor Polynomials. Furthermore, the research results indicated that applying Variation theory, when planning the technology-assisted teaching, supported and enriched students' learning opportunities in the study group compared with the control group.

*Classification:* N55 U75 I25 I95

*Keywords:* Taylor polynomial; teaching; university education; variation theory

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