

# **Integrating Computers into Mathematics classes in a Unique way – Classroom Examples**

**R. Hoffmann, R. Klein**

Kibbutzim College of Education,  
Tel Aviv, Israel

[ronit\\_hof@smkb.ac.il](mailto:ronit_hof@smkb.ac.il) , [ronit\\_kle@smkb.ac.il](mailto:ronit_kle@smkb.ac.il)

Lecture Proposal for the ACDCA strand

## **ABSTRACT**

In our efforts to integrate computers into mathematics classes and expose the students to new teaching methods, we developed two technology based courses. These courses are taught to mathematics B.Ed and M.Ed students in a teacher training college. Our aim is to provide the students with tools to solve various kinds of mathematical problems assisted by computers and to help them increase their mathematical abilities.

The students are exposed to new and vital subjects which are ordinarily absent from the regular school programs (in Israel). They learn how to deal with problems in a modern and different way. The students get acquainted with the mathematical ideas and numerical methods embedded in the computer, calculator and graphic calculator or in other words, understand "the story behind the key".

In our presentation we will briefly describe the content of the courses. We will start with computing square and cubic roots using the intuitive 'trial and error' method followed by Heron's method (100 a.d.) and generalize both to first and second order numerical methods. This will enable them to solve even equations which have no analytic solving formulas (exponential, trigonometric or polynomial of a degree greater than 4). We use the Mathematix software (an Israeli CAS) with Excel spreadsheets or GeoGebra to obtain the graphs of the appropriate functions in order to define the number of solutions (if any) and to find them numerically. We will present additional examples (as time allows) such as  $xe^{-x} - 0.25 = 0$  and the third degree polynomial equation  $x^3 + 2x^2 + 10x - 20 = 0$  which was solved by Fibonacci (1225). The solution presented is 1.36880810 and nobody knows how it was reached.

We hope that this modern model of teaching will be integrated into the curriculum and our students will be the agents who will incorporate it into schools. We believe that our task as teacher educators is to raise the students' curiosity as to how math serves up to date technology and by doing so raise the next hi- tech generation.

## **Keywords**

Mathematix, Excel spreadsheets, GeoGebra, teacher training, Solving problems assisted by a computer, Numerical methods.