



Introducing students to effective learning methods

Cyprus Mathematical Society and experts utilise interesting approaches to instil math knowledge in students



By Professor Gregoris A. Makrides

It is well known nowadays that the teaching of mathematics, and most subjects, continue to follow the same format for the last 100 years or more. When one views a photo of a classroom 100 years back and a photo of today's class, the only difference may be the colour.

The challenges for teachers to keep up the interest of pupils in the learning process is increasing, as students nowadays have access to learning resources through new technologies and media, which in most cases make today's teaching and learning environment look primitive in comparison.

One could try to discover the best method for teaching pupils by watching what they do after they depart from the school every day until the time they go to bed. Teachers need to adapt to the ways pupils like to learn and escape from the traditional approaches. In other words, teaching methods have to compete with what pupils enjoy outside the classroom environment.

In the sections below I chose to present four different approaches in learning and a challenge for teachers to apply them in teaching mathematics at different ages – from primary education to adult learners. Each section describes a completed or ongoing project co-funded by the European Union under the programme ERASMUS+. Each project is producing a new method/



Le-MATH: Learning mathematics through new communication factors (project 2012-2014)
www.le-math.eu and www.euromath.org

This method uses theatre and ideas from the well-known TV game *X-Factor* to motivate pupils to participate in MATH-Theatre activities and in the so-called MATH-Factor competition. In the MATHeatre, one can see the use of communication skills mixed with cooperative learning to discuss through theatre mathematical ideas and knowledge that both actors and audience can understand and enjoy. The MATHFactor requires a pupil to explain mathematics knowledge in an attractive and sometimes funny approach to be understood by a non-expert audience. Today, this is done in a competition form with jury and audience in an international playground, the EUROMATH annual pupil's conference (www.euromath.org) targets ages nine to 18. One should remember that when a teacher enters a classroom they have to do one simple praxis – transfer new knowledge to non-experts – therefore they need to have excellent communication skills to do this.



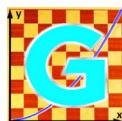
MATH-Debate: The Voice of Students – Searching excellence in math education through increasing the motivation for learning (2016-2018)
<http://mathdebate.eu/>

Students' attitudes towards mathematics are not at the optimum level. In this project, the idea is to let them approach it with a choice of teaching method they prefer, making them major actors of the learning process. In addition, this project uses the debate approach between students on mathematics problems and ICT methodology, so that students' mathematical skills and their abilities to solve practical problems improve. The project promotes an excellent opportunity for making arguments between minds, criticising different opinions on some topic, all of it with one goal – achieving improved students' skills and motivation in the learning of mathematics.



MATH-Labyrinth: Increasing the level of knowledge through solving mathematical problems (project 2015-2017)
<http://www.math-labyrinth.eu/>

This project developed new methodologies in learning and teaching mathematics to students of ages 14 to 18, which can be used in any school environment. The aim was the development of methodology in teaching and learning mathematics with the creation of an interactive book that can be used by teachers and pupils. The interactive guidebook comprises mathematics that is relevant and applicable to everyday situations. It is developed to enhance the brain's ability to visualise and transform knowledge into a solution of a real-life problem. Almost all problems developed and presented in the portal are word problems. Word problems are found to be very important to develop analytical skills for pupils, and at the same time, improve the skill of understanding languages. The name Labyrinth refers to the complexity of providing solutions. In order to solve a problem, several operations are required and students need to go back and forth through all the acquired knowledge they have during their education.



MATHGAMES - Games and mathematics in education for adults (2005-2018)
www.math-games.eu

This project developed a Compendium (a set of traditional games that require use of basic mathematics), a Guidebook with lesson plans that can be used by adult trainer for training adults and a Course for Numeracy Learning Methods Based on Games to be offered as a European course. The Compendium and the Guidebook is published in nine languages, which should give the answer to two main questions, while raising numeracy in education:

1. How can we reduce the number of underskilled adults to promote social integration and participation into our society?
 - How can we increase incentives for adult training by using games?
 - How can we offer tailored learning opportunities to individual learners by using games?
 - How can we provide information on access to the services of adult learning?
2. How can we save traditional and famous games in different countries from disappearing over time?

approach in teaching and learning mathematics that is considered innovative. The project websites are shown for those who like to discover more. The approaches can be used in all sciences.

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