

Geometry of excellence with the help of the computer

Oltea Angela Copaci¹, Elena Petria Boldea²

¹Liceul Teoretic SOCRATES, Timișoara, România

²Inspectoratul Școlar al Județului Timiș, Timișoara, România

copaci22@yahoo.fr lelicaboldea@yahoo.com

ABSTRACT. *“Geometry of excellence with the help of the computer” is a project designed and begun by Liceul Teoretic SOCRATES and I.S.J. Timis, in partnership with Rotary and Rotaract Clubs in Timisoara throughout the school year 2009-2010. It is addressed to 7th and 8th grade students who have just started the study of Geometry and who, using a modern approach, can more easily reach performance. The students come on Saturday to the Centre of Excellence, which is located within Liceul Teoretic SOCRATES.*

1. Justification of project:

Needs:

The need of organising, monitoring and guiding students in an organised and competent environment, as an extracurricular activity.

A new approach of creativity, competence and passion is a good chance for distinguishing oneself, which students acquire at the Centre of Excellence.

Together with the competitive side, there is also the strong formative one, which is a quality “training” for gifted students (at present and in the future).

Constraints:

There has been a decreasing interest for performance lately.

Lack of material resources required for stimulating students and rewarding those who persevere and obtain very good results.

Different time-lapse between classes in different schools, both for students and teachers.

2. Purpose and objectives:

Purpose: offering a “friendly” way of studying Geometry, in a permanent competition, using the latest technology, in an organised and competent environment.

Objectives:

- shaping a mathematical thinking expressed by adequate mathematical behaviour;
- causing an intrinsic motivation for the study of Mathematics;
- causing practical behaviour oriented towards active use of knowledge in Mathematics;
- spotting out elements for highlighting creativity in handling the mathematical apparatus;
- stimulating the competitive environment for natural development of the student, not only in the study, but also in the mentality.

3. Operational plan of action

The project required following certain achievement stages.

3.1. The information stage based on informing teachers and students about the project's purpose, which took place in October 2009, as well as throughout the whole development of the project.

3.2. The organisation stage, which took place in October, consisted of forming the group of students with abilities and interest in Mathematics from secondary schools (7th and 8th grades) in the county and informing the group of mentor teachers who work or will actively work at the Centre of Excellence. A plan in concordance with the analytical program, the theoretical part and auxiliary materials (work sheets, test papers, educational programs) were designed.

The impact was greater than we thought both in the case of the students and that of the teachers, so 74 students (in the 7th grade) and 61 students (in the 8th grade) subscribed. 14 teachers with great experience who master working with new technology wanted to help the implementation of the project.

3.3. The achievement stage: is based on formation activity development, on monitoring and analysing the evolution of the group of students with abilities or interest in Mathematics through the implementation of the designed programs.

The achievement stage of the project takes place from 1st November 2009 until 30th June 2010, according to the planner.

Up until now ten activities took place on Saturday at the Centre of Excellence, located within Liceul Teoretic SOCRATES, according to the planner.

During these activities students listened to the teachers, who using a laptop, an overhead projector, a smart board, exhibited a Geometry issue through some well-known educational programs ("between game and a 10" from Intuitext) or the ones designed by the students themselves. Students also solved real problems using the devices for geometrical figure drawing with the help of the high-tech tools offered to everyone by GeoGebra's site: www.geogebra.org. or by some programs designed by teachers.

Each time students finish their classes, they are assessed and their results are published on the school's site (www.liceulsocrates.ro) or on the site of the Centre of Excellence (www.excelenta.liceulsocrates.ro).

According to the rule, a ranking will be made with the points students receive during each stage, alongside with those from the final competition. The first students in the

ranking will be rewarded by the sponsors and will be read about in the section of the Centre of Excellence's site called "We take pride in them."

We would like to mention that access to the centre of excellence is free of charge!

3.4. The analysis, synthesis and assessment stage: requires analysing the activities and spreading out the results of the study with the purpose of building public opinion concerning the problems of the gifted students, of introducing new technology in the teaching process and of the impact all those have on the rigorous shaping of mathematical or intuitive thinking of the students.

3.5. The final assessment stage of the project: highlighted by the final report for establishing the positive and negative aspects of the project, taking into consideration the following:

No	OBJECTIVES	POSITIVE ASPECTS	NEGATIVE ASPECTS
1.	Shaping a mathematical thinking expressed by adequate mathematical behaviour	Increasing interest of students in "new teaching methods", which include: the computer, the smart board.	Lack of interest of some students in deeply studying the field
2.	Causing an intrinsic motivation for the study of Mathematics	Understanding the need for clarity in thinking (necessary in the making and doing of homework by students)	Lack of perseverance in the study
3.	Causing practical behaviour (using the computer and the Internet) oriented towards active use of knowledge in Mathematics	Interest in mathematical programs on the computer which through "game" stimulates the process of learning	Tendency towards superficiality induced by the "easy" way of "mathematical itineraries" suggested by each theme's games
4.	Spotting out elements for distinguishing creativity in handling the mathematical apparatus	Desire to be original and to be appreciated	Difficulty in removing some wrong skills in handling the mathematical apparatus
5.	Stimulating the competitive environment for students' natural development, not only in the study, but also in the mentality	Through testing and rewarding students during each stage, the spirit of combativity and fair play is developed	Desire to gain prizes greater than that of performing

4. Expectations of project results

- Putting together a “team” of students who should carry on training for excellence, who should participate in local and national competitions.
- Materials designed after the project has come to an end will be an important aid for student training in the future.
- Due to the competences acquired through the participation of the team of teachers who work at the Centre of Excellence, at seminars and workshops held at the National GeoGebra Institute in Timișoara, Romania, the latest approaches to geometrical issues through the help of the computer can be applied in the didactic work.

5. Project Team

Coordinators:

Prof. Oltea Copaci Angela – Director al Liceului Teoretic SOCRATES

Prof. Boldea Petria Elena – Inspector Școlar de Specialitate, I.S.J. Timiș

Collaborators:

Prof. Roman Vasile, Școala cu cls. I-VIII, nr. 7 „Sfânta Maria”, Timișoara

Prof. Roman Adriana, Școala cu cls. I-VIII, nr.7 „Sfânta Maria”, Timișoara

Prof. Fuiogă Ghizela, Liceul „C.D.Loga, Timișoara

Prof. Cîmpianu Carmen, Școala cu clasele I-VIII Iecea Mică

Prof. Grigoraș Camelia, Școala cu clasele I-VIII Cărpiniș

Prof. Taiga Florentina, Școala cu clasele I-VIII, com. Uivar jud. Timiș

Prof. Mișca Ioan, Școala cu clasele I-VIII, com. Fibiș jud. Timiș

Prof. Mișca Maria, Școala cu clasele I-VIII, com. Fibiș jud. Timiș

Prof. Mișca Voicu, Școala cu clasele I-VIII, com. Fibiș jud. Timiș

Prof. Popa Adriana, Școala cu clasele I-VIII, nr.7 „Sfânta Maria” Timișoara

Prof. Bînzar Adriana, Gr. Școlar „I.Mincu”, Timișoara

Prof. Don Lucreția, Liceul Teoretic SOCRATES Timișoara

Prof. Molin Monica, Liceul ”N. Lenau”, Timișoara

Prof. Popescu Luminița, Școala cu clasele I-VIII, nr .6, Timișoara

Prof. Ștefănescu Aura, Școala cu clasele I-VIII, Bulgăruș

Prof. Mariș Florin, Școala cu clasele I-VIII nr.2 Lugoj

Prof. Mariș Adriana, Colegiul „C. Brediceanu” Lugoj

Prof. Pană Delia, Școala cu clasele I-VIII nr.1 Lugoj