

“New Paths in Math – innovative methods in math for engineering students”

2017-2019



TEACHERS' STORY



Dear teachers,

The main aim of this publication is sharing experiences gained by several European teachers during implementation of the project “New Paths in Maths”

If you would like more information on our project please visit the project website www.newpathsinmath.eu

Here we would like to tell you about our observations, various advantages and disadvantages of project work and our personal or subjective opinion.

Firstly we would like to introduce ourselves. We are maths and English teachers from five European countries: Poland, Bulgaria, Italy, Cyprus and Portugal.

Anna Sulek

Zespół Szkół Elektronicznych I Licealnych, Warsaw, Poland

Rumiana Georgieva

Profesionalna Gimnazia Po Mehanoelektrotehnika I Elektronika, Burgas, Bulgaria

Manuela Beltrami

Enrico Martoglio

I.I.S.S. Einaudi Casaregis Galilei, Genoa, Italy

[Evgenia Chatziioannou](#)

B Techniki Scholi Lemesou Gregoris Afxentiou, Limassol, Cyprus

[Ilda Santos](#)

Escola Secundaria Campos de Melo, Covilha, Portugal



Anna Sulek – the main coordinator of the “New Paths in Math” project. She has worked as deputy headmaster and maths teacher in ZSEiL in Warsaw Poland since 1996. She is a Scientix Ambassador and an enthusiastic implementor of new technology in her classroom. She has been a school coordinator of Comenius and Erasmus+ projects for the past ten years and they have been really successful and instrumental for her school and local community. Her experience, qualifications and involvement are recognized by national and international educational authorities. She often has opportunities to share her ideas and solutions among teachers and stakeholders.

Rumiana Georgieva - a master mathematician and a math teacher. She has been working in education for almost 20 years. During this time, she has repeatedly encountered situations in which students find it difficult to learn specific things in their special subjects because of their gaps in mathematics. She was also able to find that students more easily perceive important details from their special subjects when they have a good understanding of the mathematical part of the problem. This has led her for years to look for ways to diversify or find a more appropriate and interesting way to teach mathematics to such students.

Manuela Beltrami - international project coordinator at IIS Einaudi-Casaregis-Galilei, an industrial and commercial technical high school in Genoa. She teaches English in the International Relations section and have been working on European projects since 2014.

Ms Evgenia Chatziioannou - teaches Mathematics since 1992, the year of graduating University of Athens in Greece. She obtained a Master's Degree in Mathematical Statistics from University of Cyprus. She participated in many conferences either for self- development or with students by presenting mathematics in theatre, art, games, nature, government, geography. She has written Mathematics for the theatre and competed with her students in National Award Competitions like Mathfactor and Maththeatre, gaining two first, one second and two third prizes.

Ilda Santos is a licensed teacher in mathematics teaching with a master's degree in Education at the University of Beira Interior and another in Management and School Organization at the Universidade Nova de Lisboa. She has the scientific certificate of trainer of the Portuguese Scientific Council and the course of trainer etwinning. His taste for mathematics and teaching technologies transforms the classroom into innovative educational environments.. She is a teacher who promotes volunteer activities and promotes diversified teaching using new technologies.

Enrico Martoglio - math teacher at "Einaudi - Casaregis - Galilei". Main teaching fields (beyond calculus and algebra) are applied and financial mathematics; this means teaching how to analyse data and build related mathematics models to describe the real phenomeon and teaching the financial topics involved in capitalisations (simple and continuos), money management, lending and borrowing, buying and investing, calculating the inner interest rates of common financial operations.



As introduction we would like to share with you the letter written by our colleague and electronics teacher from Genoa – Giuseppe Canepa.

Dear friends,

I have always thought that this Erasmus+ project could be a good opportunity for students and teachers to start together an important journey through friendship and cultural experiences.

So it was. During more than two years of activities I got to know extraordinary people and places. I contributed to the growth of my students even outside the school, taking part in challenging activities that, together with the works produced by the other schools, could be a starting point and a stimulus for further work.

It is when we meet someone who is different from us that we can really get to know ourselves and the OTHER, increasing awareness and giving value to the construction of the human community.

Italy and, perhaps, Europe are emerging from a period of individualism and from varied forms of collective individualism that have degraded human relationships.

Our young people are giving us great hope. The Erasmus Programme is the only activity that is creating a European cultural identity. Maybe, we can boast of being obstinate carriers of this idea of community.

It has been a honour to meet you.

Giuseppe Canepa

06/10/2019



How has your work style changed after participating in the project for two years ?

“I think that now I pay more attention to the fact that I educate future engineers. I am able to show them various opportunities to use their science knowledge in a more convincing way. Visiting such places like the Italian Institute of Technology or Therapy Clinic in Limassol changed my own insight into developing science and engineering market. By focusing on math application in a wide variety of disciplines, I have gained both knowledge and credibility with my students.”

Anna Sulek

“It has affected my way of teaching in a practical way, my lessons are more focused on problem solving and I can organise and manage teamwork better. “

Manuela Beltrami

“During the project, I was able to learn unknown types of software for me, which I applied more than once in my preparation and presentation of my lessons to students. This increased the interest of the students and then they wanted to teach them to use the different software applications. This gave me a reason to include many group work assignments, to get them to research on their own, and to formulate conclusions about many properties of mathematical objects.”

Rumyana Georgieva



“I use even more technology in my classes, basically Geogebra software. Students are more motivated to attend the lesson, so results of students have improved.”

Evgenia Chatziioannou

“Since I discovered new approaches settled in new different school systems, this gave me the opportunity to watch and test myself new skills in everyday teaching.”

Enrico Martoglio

“My teaching method has changed about the form I teach some mathematical concepts. Now, I relate them to concrete examples covering other areas, as electronics and ICT.”

Ilda Santos



What changes have you observed in your classroom ?

“The students who participated in the New Paths in Math experience are more self-confident, motivated and willing to get involved in new projects. Their communication, social and organisational competencies have greatly improved. They have learnt how to interact in English in real situations, to speak in public, to work on a team and to achieve practical goals meeting deadlines and taking their own responsibility.”

Manuela Beltrami

“I have observed in students a more effective autonomous and collaborative work, correlating what they learned in mathematics with some applicability in electronics.”

Ilda Santos

“The kids who were involved in this two year experience grew up quickly and more responsible than the other class mates.”

Enrico Martoglio

“By applying the lessons learned during the project (different software and best practices shared by my colleagues from Poland, Cyprus, Italy and Portugal), I was able to increase my students' motivation in learning mathematics, which led to their achievement in special subjects. I began to apply Collaborative learning (group work) more often in the preparation and learning of my students' mathematics knowledge. We experimented with so-called Flipped Classroom training. We have found that the use of electronic and communication devices in the learning process (naturally without overdoing it) produce better results in mathematics education for this generation than "digitally dependent" children.”

Rumyana Georgieva

“Nowadays young people need teachers who are ready for the future and new challenges. If we look for new ways of personal development as well as try something new in an area which isn't easy or natural for us then our students believe that our advice is worth remembering and we can help them start their adult life. Students always appreciate additional effort and if our every-day lessons are more creative then even maths isn't very tricky for teenagers.”

Anna Sulek

How has the process helped you in teaching (conducting lessons, giving feedback, etc) ?

“This experience gave me the opportunity to boost them so-called “learning by doing” approach in every day working, using techniques like gaming, riddles solving, flipped classroom, data analysis.”

Enrico Martoglio

“The lessons I learned from my colleagues from other countries, the seminars we attended during the mobility sessions, gave me ideas for changing my teaching style, increasing the number of assignments that required analysis and synthesis of acquired knowledge and, above all, learning through doing. I will not hide that during the project I realized the importance of seeking and receiving feedback (until then, for me, it was just a compulsory part of the lesson no matter what it shows)”

Rumyana Georgieva

“During the two years of project implementation I have spent a lot of time with my students in new different situations. We worked together, travelled, discussed various non-school related topics and sometimes had fun. The level of teacher-students interaction is now very different than two years ago. I am still a strict maths teacher, but I perceive my students in a more partnership-like way. Now when I see them as open, creative and responsible young people, they really try not to disappoint me, are more ambitious and open up to new educational challenges.”

Anna Sulek

“In the classes planning, I stopped being the center of the moment and started to point out the effectiveness of what should be the learning of students, always leading them to seek solutions for presented problems.”

Ilda Santos

“The comparison and the exchange of good practices with my partners has represented a precious source of inspiration for my lessons. Now I feel more creative and I can plan more varied and involving activities for my students.”

Manuela Beltrami

What benefits did you experience from meeting and collaborating with teachers from other countries and cultures ?

“Interaction with teachers and students from the other countries have confirmed my belief that mathematics is so important for every culture. More specifically we, the Math teachers, have exchanged good practices by discussing lessons that were prepared and presented by students with the use of technology. More or less subjects are common in the five partner schools, so students are indeed convinced that mathematics is same for all. Language skills were also very important benefits from the meetings. Friendship is a great value that also outcame from the project. “

Evgenia Chatziioannou

“Interacting with partners and stakeholders of other countries has both increased my command of English and broadened my cultural horizons, strengthening my sense of belonging to Europe and stimulating my curiosity to travel and learn more.”

Manuela Beltrami



“I think that now I am more conscious of the challenges and responsibilities which we teachers face in present-day Europe. I am now more confident that our work is really important in shaping the minds of the future generation. As educators we therefore have a big impact on young people who will be future leaders of industry in the EU.”

Anna Sulek

“By interacting with other cultures in other countries we gain relations, we improve language practice, mostly English; we observe classes on different contexts and with other methodologies. We also establish learning-teaching relationships, discuss problems and solutions. All those interactions lead to improve our success for teaching new generations.”

Ilda Santos

“I had the opportunity to speak English during the meetings and write in English in every task we had to complete. I tested new software, hardware equipments and web applications. “

Enrico Martoglio

“Without neglecting the software products that have become my primary teaching assistant, I firmly believe that meetings and collaboration with teachers from other countries have been the greatest benefit to me, personally and professionally. I am happy that I was able to observe the teaching style of some of them and to "steal" ideas from my lessons. I think I made a friend in each of them. Introducing me to each of my colleagues helped me grow intellectually and emotionally, and getting to know their culture enriched my common culture for their countries and habits.”

Rumyana Georgieva



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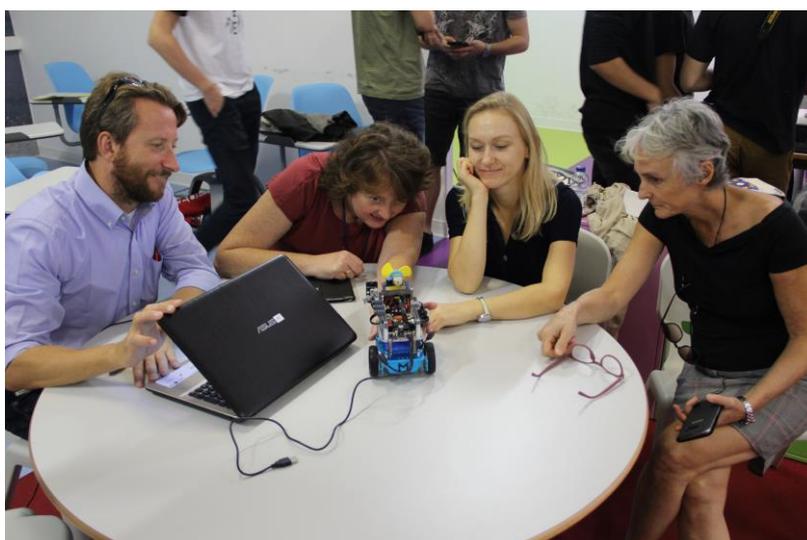
What advice would you give to teachers who are starting their journey with new Erasmus+ projects ?

“Just start and never give up ! Implementation of Erasmus+ project is very hard work but the satisfaction from the results is really huge. It is a team work and always there is somebody well-experienced who will help you to make the first step. You will have support of your main coordinator, your National Agency and others. You will observe your students in a different light as well as experience new situations and learn a lot about yourself. The biggest challenge is to leave your comfort zone but it will make you stronger as a teacher. As a result you will reach a higher level of self-confidence and satisfaction. The added bonus is making friends with European educators, building your personal network , brushing up your language skills and of course visiting other countries in our EU community.”

Anna Sulek

“Firstly, I would tell them to quit in advance if they cannot afford three years of lasting participation. Second, they will need to set up a very large amount of energy and time to spend in all the activities. However, all the resources they'll spend in this kind of project will pay them with unforgettable moments of professional and personal growth. Their kids and families will surely appreciate their efforts.”

Enrico Martoglio



“I would suggest they should find reliable colleagues in their schools with whom to share tasks and responsibilities, which is not so easy.”

Manuela Beltrami

“For those who are starting in Erasmus+, I advise them to be collaborative, very proactive, embrace an entrepreneur soul, and then you will be mostly capable to instill these characteristics in your students. That will give them some life experiences and will mark them and make them more European Citizens.”

Ilda Santos

“Do not hesitate, because any experience gained through your participation in such a project is one of the best investments in yourself.”

Rumyana Georgieva

“To get the most of the project meetings. To work hard, collaborative for the benefit of their school, their students and themselves of course. On the other hand, there is much pleasure of it, due to leisure activities and visiting new places. It is really worth of it.”

Evgenia Chatziioannou



What was the most useful thing you have personally learnt ?

“There is no clear answer to this question. But since, in my opinion, we are first people, then teachers and then mathematicians, I will say that the most valuable to me are the friends I have made, then the new teaching techniques and math lessons and seminars I have attended.”

Rumyana Georgieva

“For me the most useful aspect was practising my leadership and communication skills. I am a person who normally prefers to work independently and to take total responsibility for her work. As the main coordinator however I have had to manage an international group of teachers from different cultures, with different experiences and expectations. It was essential to work as a team. My challenge was to encourage collaboration, to effectively delegate duties and stick to the agenda.”

Anna Sulek

“I learnt how to organise my work, how to plan mobility flows for groups and how to interact with stakeholders. “

Manuela Beltrami



“I found out that the Italian school system (with its well known flaws and problems) is not that bad as I used to think.”

Enrico Martoglio

“Not knowing local languages of the partner countries could be difficult to communicate with local people. However, at the end, language was not a barrier because we go with open arms and we are received with the same enthusiasm.”

Ilda Santos

What was the highlight of your experience with “New Paths in Math” project ?

“Meet very advanced technology research centers, attend lectures from renowned mathematical scientists, and acquire knowledge sharing. Visit different cultures, and verify the positive recognition of students, parents, schools and municipalities.”

Ilda Santos



“Friendship, growth, travelling, sharing, fun, history, culture, Europe.”

Enrico Martoglio

“Stronger in European family “

Evgenia Chatziioannou

“When I found out there were people here in Bulgaria and in Poland and in Italy and Cyprus and Portugal, and maybe in other countries, with which we can find New Paths in Math for our engineering students.”

Rumyana Georgieva

“There were lots of highlights, from the visits to universities and research centres to the workshops and games, as well as the cultural and recreational activities we took part in. Every moment was precious and contributed to implement my professional and cultural competencies and to strengthen my relationship with my partners.”

Manuela Beltrami

“After two years of really hard project work the most important for me is the awareness that we did a great job, that our students had a great time while finding new paths in math and that we are a great international Erasmus+ team.”

Anna Sulek

All teachers involved in the project took part in a final survey. Almost all of them assessed the project as very successful.

The comments we received in open questions were also very positive and made us aware that all the effort we put into this project was worthwhile. Here are some of them:



“Excellent collaboration between all partners, a great opportunity to strengthen relationships in Europe”

“This project made me realize my potential as a mathematician, as a teacher, as a colleague. I believe that with our participation in this project, many of our students have realized the close connection between mathematics and the various engineering majors they are studying, for them mathematics is no longer just another compulsory subject at school. In the course of my work on this project, I have learned new teaching applications and greatly improved my work in others I have already used. In preparing each assignment, I was able to impart new mathematical and technical skills to my students with new products. "New Paths in Math" is a project that has opened up new avenues for me and in career development - during the project I was motivated to participate in several additional trainings (some of which were shared with me by the project coordinator, for which Thank you so much). Last but not least, in my work on this project, I have met incredible colleagues in each of the other project countries. It was an honor to work with them, I was able to "steal" something valuable from each of them. In my heart, each of them remains a friend and I very much hope that I can work with each of them again. Thanks! I can firmly state that this project enhances me professionally, emotionally and socially. Thanks again!”

“It was amazing how people from five different countries have established a strong communication bond and we will keep communicating and exchanging ideas in the future, as good friends”

“It was a great pleasure to work in this project which gave our students and even myself the opportunity to grow up personally, develop the 4C's skills and to increase our knowledge and understanding better other cultures and educational systems! Thanks and hope to see and work with you all soon!”

“This project made me discover new opportunities in the management of a vocational school. I believe that with our involvement in this project, many of our students have realized the close connection between mathematics and the various engineering majors they have studied. Thanks for the chance I had to work with all the partners in this project.”

“In preparing the activities for this project and through my participation in the planned lectures and workshops, I learned new teaching applications and significantly improved my work in others that I have already used. In the preparation of each assignment, I was able to give new mathematical and technical skills to my students with new products.”

“By participating in this project, I was able to enhance my professional and social skills. Thanks for the opportunity.”

“By being given the opportunity to participate in the activities of this project, I was able to convince myself of the need for close collaboration between us engineering teachers and our mathematics colleagues, to better educate our students.”

“While working on this project, I learned new applications for teaching mathematics. In the course of lessons prepared by colleagues from other countries, I was able to give new mathematical and technical skills to my students.”

“It was a great project”



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