

IMPORTANCE OF STEM TEACHERS' NETWORKING FOR THE SUCCESS OF EUROPEAN PROJECTS

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Abstract

The number of STEM teachers from Macedonia who participate in STEM related networking events aimed to enhance their professional development within the field and held within the framework of European projects has increased. There are different models of networking for teachers: online networking and face to face networking. Face to face networking can be a one day event or a longer event held in the span of several days. During networking events, teachers collaborate together in formal and non-formal ways and create professional communities, which are related to education issues in general and to STEM content in particular.

In this study, we checked the views of 34 teachers and interviewed 10 teachers from Macedonia that had previous experience where they shared their views with others during such networking events and have already contributed a lot to the success of the European projects mentioned before.

Most of the teachers have positive opinions about the networking events and claim that these kind of events contribute not only to their personal interest in teaching STEM subjects, but also to their professional development. In addition, the interviewed teachers mentioned how these networking events contributed to the development of their personal skills such as self-confidence and communication.

However, teachers considered face to face networking events to be more effective than web-based events. We found that these networking events contributed to the success of European projects, because teachers who participate in these networking events feel more involved in the project. They meet colleagues from different European countries, share ideas and experiences one with others and build a joint platform that is based on the common wish to succeed in the completion of a special project together with their students.

Key words: networking, collaboration, STEM teachers, EU projects

Introduction

During the last decades networking events in the professional world have become very common. This is also the case within the teaching profession. One definition of networking is that it is an important tool for professional development and career management. Many think that a teacher's career has very limited possibilities; however, networking events can help teachers promote themselves in personal and professional ways. Teachers can contribute to others and be affected by their peers in a way that will open their horizons to a new world of experience and possibilities. The definition of "networking" can be considered as a human capital that includes individuals. There is a connection between

individuals that has three steps: acquaintance, accessibility and barter. Networking allows accessibility to resources such as: information, influence and support. The teaching profession is known as a lonely one. Most of the time, the teacher is by himself/herself in a class of twenty to thirty teenagers as a "lonely wolf". Of course, at school there are breaks, but they are too short for a real networking process and most of the time, teachers are so busy at school with their duties that they don't have the time or the will for meeting with their colleges.

European STEM projects can be considered as an excellent platform for these kind of events. Networking events that refer to these projects usually happen out of school. Teachers can choose by themselves in which project or event they are going to participate thus ensuring their emotional availability for these kind of events. Also, networking events of European STEM projects are content oriented, so teachers can meet many colleagues from their own field. Gatt (2009) in their article "Networking School Teachers to Promote Better Practice in the Teaching of Science across Europe", claim that regularly teachers do not have the opportunity to share and collaborate on projects with other education professionals, as their daily routine confines them to their school premises. The engagement of support using coaching, mentoring and networking activities may assist in the transfer of teacher learning to pupil learning, resulting in greater impact within the classroom experience of pupils and the increased potential to raise standards and attainment (see Joyce & Showers, 1988; Oldroyd & Hall, 1988; Wallace, 1996; Swafford, 1998; Rhodes & Houghton-Hill, 2000). The potential benefits of coaching, mentoring and peer-networking activities within schools stem from the requirement for close partnership between colleagues within an environment of trust, safety, support and mutual respect (see Ponzio, 1987; Tharp & Gallimore, 1988; WestBurnham & O'Sullivan, 1998, Harris, 2000, 2001; Thompson, 2001). In this study we collected the views of tea group of teachers from Macedonia about the influence of teachers' networking on success of European projects. According to the survey results most of the interviewed teachers have been working for more than 11 years in educational system as STEM teachers and educators. In order to collect the data, we used a Google form questionnaire with questions based on a Likkert scale (with 1 = disagree; 5 = agree). We also carried out interviews with STEM teachers during face to face events.

2. Outcomes from the surveys and interview

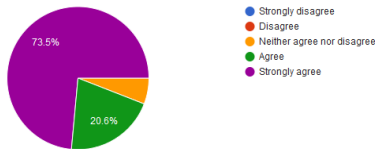
We asked teachers their impressions regarding the following statements:

1. I think that networking meetings contribute to my interest in teaching STEM subject.
2. I think that networking meetings contribute to my professional promotion.
3. Networking meetings with my colleges increases the amount of ideas that I can share with my colleagues and that my colleagues share with me.
4. There is no difference for me between networking meetings and online meetings with my colleagues.
5. Contribution of networking meetings is equal to contribution of online meeting to the progress of the project.
6. By regularly networking, and pushing yourself to talk to people you don't know, it will help increase your confidence
7. Networking is a great opportunity to exchange best practice knowledge.
8. Is your networking experience reflect positive on other projects/activities in your school.

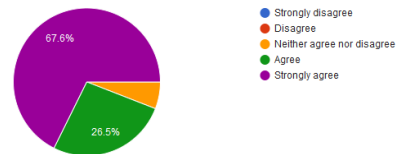
In their answers teachers agree that networking events have an impact on their professional development and their personal skills as well as self-confidence and communication. However, networking face to face events have a greater impact on teachers than an online event.

In the following figures we show the average responses from the teachers to the previous 8 statements.

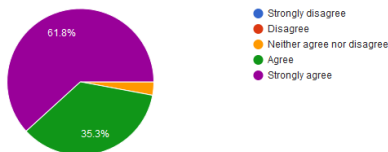
3. I think that networking meetings contribute to my interest in teaching STEM subject
(34 responses)



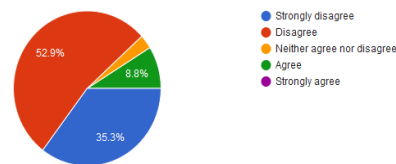
4. I think that networking meetings contribute to my professional promotion
(34 responses)



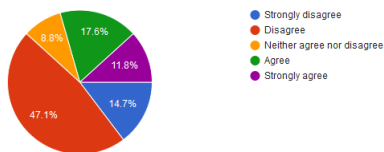
5. Networking meetings with my colleges increases the amount of ideas that I can share with my colleagues and that my colleagues share with me
(34 responses)



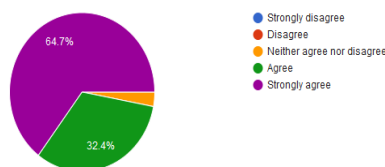
6. There is no difference for me between networking meetings and online meetings with my colleagues
(34 responses)



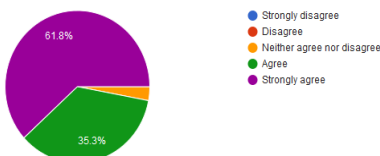
7. Contribution of networking meetings is equal to contribution of online meeting to the progress of the project
(34 responses)



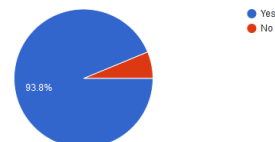
8. By regularly networking, and pushing yourself to talk to people you don't know, it will help increase your confidence
(34 responses)



9. Networking is a great opportunity to exchange best practice knowledge.
(34 responses)



10. Is your networking experience reflect positive on other projects/activities in your school
(32 responses)



In their answers teachers agreed that networking events contribute to success of European STEM projects. They attribute this kind of contribution into two categories, personal and professional.

From the interviews, we provide here a selection of teachers' statements about personal contribution of networking events:

- “international friendship making possibility”
- “teaching tolerance, understanding different point of views”

- "It's a great way to meet like-minded people, get new motivation and energy, share ideas, set up new contacts etc. "
- "networking is a chance to share not only expertise but also a way to team work. Several time during a networking event I had the chance to plan new lessons, projects or I could improve my skills because of the interaction/help/input of some colleague. Online meetings are good, but they are more content oriented... During networking meetings you can also find synergies with colleagues that come, in my opinion, only when you're able to go over contents. I appreciate very much also when a colleague share something in which he/her is expert, because I believe that he could already test and validate that lesson/methodology, tip..."
- "Good friendship between teachers is also a way to fortify the network because we know that we can trust and on a colleague and refer to him/her if necessary (and this is something that is impossible to achieve through online meetings!)"
- "I like it! It is interesting for my job, for myself. Great ideas! New friends who have similar interests." "Opportunity to share my knowledge and to learn a lot from others. Not only about education, but also about their lives, countries, societies... then with this face to face meetings I am growing as a person, and it makes me a better human being and thus a better teacher."

In their answers some teachers mention important social skills such as friendship and team work, skills that were demonstrated during networking events and contribute to their professional skills and work in European projects.

Social networking is as important for teachers as it is for others. There are a number of ways that one can take advantage of networking: sharing ideas, possible partnership with other schools, possibility of future professional development, getting information. Sometimes the most important things to know and recognize, happened at the non-formal meetings that are an integral part of every networking event.

The teachers' statements about the professional contribution of networking events are:

- "Networking helps to focus. It is important to get information, how to increase the success of STEM-activities. You can hear from others with lots of experiences, which activities will work and which not. In addition to that it empowers to create new activities, which can be shared with teachers all over Europe. That's great."
- "Makes me think about education globally. I feel like the part of something bigger than only leading my students through the curriculum requirements. By sharing and working with other educators I can not only widen my view of the world but also feel how enriching the working with other people is, and so I am even more motivated to help my students develop working in groups skills. And I constantly remind myself how it feels to learn new things from others, so I do understand the process of my students development better."
- "The chance to open new fields of thinking, exchange new and different ideas learning new concepts and develop new skills such as the use of English."
- "Networking helps share ideas and keeps me motivated as a professional."
- "Working within a community of practice, sharing ideas, learning with and from others. Creating professional opportunities within the group."

Most of the teachers in their answers trough the survey and interviews offered very similar answer that combine two categories and refer both to personal and professional benefits and contribution of networking events to success of European projects.

The most mentioned international projects/funds/ among the teachers were Scientix, Go-lab, Globe program, Erasmus + and European Schoolnet as well.

Scientix is a great "umbrella" for a large number of European STEM projects. These projects have a lot of networking events, online events and face to face events as meetings,

workshops, summer schools and academies. Many teachers from European countries participate in these events. Most of the teachers are experienced teachers who are willing to increase their interest in teaching STEM subjects, add diversity to their professional skills and knowledge. Also, teachers who participate in these events are open mind to a different cultures and ideas. The combination of personal and professional skills demonstrated during networking these events, makes these events contribute to success of European STEM project. The main stakeholders of Scientix are teachers, researchers and project managers in STEM education, and policymakers. Each of these groups can benefit from Scientix activities and events.

The Go-Lab Project (Global Online Science Labs for Inquiry Learning at School) opens up online science laboratories (remote and virtual labs) for the large-scale use in school education. The overall aim of the project is to encourage young people aged from 10 to 18 to engage in science topics, acquire scientific inquiry skills, and experience the culture of doing science by undertaking active guided experimentation. To achieve this aim, the Go-Lab project creates the Go-Lab Portal allowing science teachers finding online labs and inquiry learning applications appropriate for their class, combining these in Inquiry Learning Spaces (ILSs) supporting particular lesson scenarios, and sharing the ILSs with their students. Using the ILSs, the students receive the opportunity to perform personalized scientific experiments with online labs in a structured learning environment.

European Schoolnet is a network of European Ministries of Education. As a not-for-profit organisation, they aim to bring innovation in teaching and learning to our key stakeholders: ministries of Education, schools, teachers, researchers, and industry partners. Since its founding in 1997, European Schoolnet has used its links with education ministries to help schools make effective use of educational technologies, equipping both teachers and pupils with the skills to achieve in the knowledge society. European Schoolnet provides both Ministries and schools with: information and services relating to the innovative use of educational technology; outreach campaigns on specific educational topics such as maths, science and technology; and research activities. Thousands of schools are engaged in our various pilot projects and studies, testing new learning activities and technologies in the classroom, and exploring the use of new pedagogical tools in teaching STEM (science, technology, engineering and maths). They identify and develop learning resources in various languages that teachers across Europe can use in their teaching, provide peer-to-peer online communities where teachers can exchange ideas and share resources, as well as offering various training opportunities online and offline.

The Global Learning and Observations to Benefit the Environment (GLOBE) Program is an international science and education program that provides students and the public worldwide with the opportunity to participate in data collection and the scientific process, and contribute meaningfully to our understanding of the Earth system and global environment. Announced by the U.S. Government on Earth Day in 1994, GLOBE launched its worldwide implementation in 1995. GLOBE provides grade level-appropriate, interdisciplinary activities and investigations about the atmosphere, biosphere, hydrosphere, and soil/pedosphere, which have been developed by the scientific community and validated by teachers. GLOBE connects students, teachers, scientists, and citizens from different parts of the world to conduct real, hands-on science about their local environment and put in a global perspective.

The Erasmus Programme is an European Union student exchange program offering university students the possibility of studying or working abroad in another European country for a period between three and twelve months. The name of the program refers to Dutch Renaissance humanist and theologian Desiderius Erasmus of Rotterdam, the Netherlands. He

studied at several European universities and described the education as a chance for modern people.

The Erasmus Programme was established in 1987 and since 2007 the Erasmus project is part of The Lifelong Learning Program. Few years ago the Erasmus programme was incorporated, together with a number of other independent programs, into the Socrates Programme. From January 2014, the EU initiated the 'Erasmus + programme. Erasmus+ supports transnational partnerships among education, training and youth institutions and organizations to foster cooperation and bridge the worlds of education and work in order to tackle the skills gaps among the students and teachers in Europe. It supports national efforts to modernise education, training and youth systems.

Conclusion

In this study, most of the teachers mention greater contribution of face to face events, than online events. More than two decades ago, online communication became popular in education. A major need in distance education is that of providing human communication and interaction as well as well-designed learning materials. Thus communications technologies, particularly computer-based communication, or what might be called 'networking', have gradually become established as part of the delivery infrastructure of distance education (Duning et al,1993) However, Magid., Tal & Kalli (2011) in their study with students claimed that "life interaction" between students in out-school learning activities, more interest students than online interaction with their peers. Apparently, going back in time, today not only students, but teachers prefer face to face human interaction which contains personal skills that affect professional skills and knowledge. Meetings remotely, are necessary but cannot be a substitute for face to face human interaction. Each project is only the beginning of the emergence of a new project, every encounter is the possibility of finding new project partners.

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