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School Networks in Europe: a Network Analysis of the Comenius Multilateral Partnerships under the Lifelong Learning Programme

Theodoros Zevgitis and Anastassios Emvalotis***

Abstract: This paper is part of a wider study on the impact of European Education policies as implemented in the Lifelong Learning Programme (LLP) by Comenius multilateral school partnerships. It is based on a collection of data from the European Shared Treasure (EST) and is supplemented by material from various National Agencies (NAs) and relevant Eurydice reports. The data was processed in accordance with the Social Network Analysis (SNA) theory. The use of SNA gave a new perspective and richer understanding of partnership structures. The main objective of the analysis was to understand how schools from different countries connected to each other and the relations and patterns they formed. The main results of the analysis showed that the Comenius partnerships helped the participants establish strong ties among them. Secondly, the analysis revealed the central role schools from countries like Italy and Germany seemed to play in partnerships, and that often partnerships demonstrated a fixed mix of countries.

Keywords: Comenius school partnerships, mobilities, school collaboration, European programmes

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Introduction

This paper is part of a wider study on the impact of European education policies which were implemented in the LLP for the period 2008-2013. Specifically, this paper focuses on one aspect of the LLP, Comenius multilateral school partnerships. The LLP was the precedent of Erasmus+ which has as its general aim to contribute to the achievement of the objectives of the Europe 2020 Strategy. The study focused on the LLP as it managed to be the most widely known instrument of the European Commission to trigger transnational interactions and mobility (Kuhn, 2015). Furthermore, the analysis of school participation on the LLP revealed an overall picture of the impact of Comenius partnerships on schools. Moreover, it will be a starting point to study the new Erasmus+ programme. The aim of the current study was to understand how schools from different countries connected to each other and the relations and patterns they formed. In order to do such an analysis it was important to have the complete data for school participation. The existence of the EST database made it possible to collect the data regarding Comenius multilateral school partnerships. The above data was grouped by country, recording the number of partnerships each country formed with other countries. Then the data was processed in accordance with the SNA theory as it can provide the methodological techniques to describe and explore the patterns apparent in the social relationships formed in the network (Scott, 2017). Furthermore, based on the network analysis, graphs were created in an attempt to visually represent the social network which was formed. All the above reveal that the use of the SNA gave a new perspective on partnership structures and a more precise understanding of how these interactions and relationships were formed (Prell, 2012).

The Framework of Comenius partnerships

The LLP was the implementation of the European Union (EU) policies related to education (European Commission, 2006; Moutsios, 2007). One of the sub-programmes, the Comenius programme, introduced mobility actions for primary and secondary education (European Commission, 2001).

This study deals with one aspect of the Comenius programme, the Comenius Multilateral School Partnerships which support cooperation and project-based education between schools from three or more countries (European Commission, 2013). The partnerships give the opportunity to teachers and pupils across EU to work together intensively on a project of shared interest; pupils come together for project meetings, or go on visits and class exchanges accompanied by their teachers. This offers to the beneficiaries the opportunity to develop a broader outlook and learn new ways of work-

ing together and to communicate in a language which is not their mother tongue. Pupils get to reflect on the possibility of studying and even working abroad by taking advantage of the European labour market (Mendes, 2013). The Comenius school partnerships stand for around three quarters of the Comenius programme budget. In 2010, 5 700 schools received grants to set up 1 300 new School Partnerships (both multilateral and bilateral). As projects typically last two years, this means that more than 11 000 schools from all across Europe are involved in Comenius school partnerships in any given year. At the heart of the Comenius school partnerships lie joint projects or activities between partner schools. Some produce learning or teaching materials relevant to European as well as national priorities such as pupils' key competences, social inclusion of disadvantaged learners, or literacy. By developing cross-curricular activities or new ideas and programmes for teaching, schools improve their working and learning environments and strengthen the ties between staff members and the relationship between pupils and teachers (European Commission, 2012). Since 2008, became a contractual obligation for projects under LLP to upload the outcomes on the EST (Indire, 2013).

The EST (<http://www.europeansharedtreasure.eu>) is a Europe-wide database which aims to collect, promote and disseminate good practices and the wealth of experience within European funded projects such as Comenius, Leonardo da Vinci & Grundtvig Partnerships. It aims to increase the dissemination of the partnerships' outcomes and to make widely available the details of the projects.

The EST is the result of cooperation between 4 National Agencies (Italy, Greece, Austria and Poland) with the support of the European Commission. It is an easy to use, multilingual tool whose main features are the retrieval or searching for information about the outcomes and the content of European funded partnerships.

While there are available data about school partnerships up to 2010, and a basic analysis regarding the Comenius school partnerships for the period 2007-2010 has been conducted, for the rest of LLP there are no comparative studies and details per country. For further information, one should refer separately to each NA for information. This study aims to fill the current gap, by analysing in depth the school partnerships for the entire LLP. The data used for the study were collected from the EST database. The EST is designed to display information for each partnership but is not fit for statistical data analysis. For this reason, the data from the EST were collected and processed into a new database in such a way so as to facilitate statistical analysis. For each partnership, title, description and the topics assigned to it were selected. Moreover, additional data for each partner such as school name, type, address, country, contact person and the school's role in the partnership were

also selected. Finally, data regarding the outcomes of the partnerships (both joint and individual results) were collected. Apart from the data collected from the EST, other sources were used such as the European Commission reports for Comenius, the website statisticsforall.eu developed by the French NA, material from various NAs and relevant Eurydice reports.

Aim of the Research

The objective of the analysis was to understand how schools from different countries connected to each other and the relations and patterns they formed.

The main research questions that were posed at the beginning of this investigation were the following:

- What were the most commonly formed partnerships?
- Which countries played a central role in Comenius partnerships?
- Was the coordinating role proportionally shared between countries?
- Is it the school as an organization or the contact person that promotes the continuation of participation?
- Who was the main beneficiary (as far as students and teachers are concerned) of the mobility programmes among the countries participating in the partnerships?

Research Methodology

The data that was used for the study retrieved from the EST database. Above the stored projects in EST, all data regarding Comenius multilateral school partnerships were retrieved. Another online database with useful data for Comenius Partnerships is “Statistics for all” developed by the French NA (Agence Erasmus+ France, 2015) was used. From “Statistics for all” retrieved data regarding the mobilities each country conducted. Unfortunately, the database does not cover the whole LLP but only until 2009 or 2011 depending on the country. Another drawback is that less than the half countries involved in the LLP are represented in the database. Even though “Statistics for all” gives statistical information for projects funded by the LLP, these data were gathered from NAs regarding the mobilities that took place by Comenius multilateral school partnerships.

For each partnership, title, description and the topics assigned to it were selected. Moreover, additional data for each partner such as school name, type, address, country, contact person and the school’s role in the partnership were also selected. The above data were grouped by country, recording the number of partnerships each country formed with each other country. A sample of the data format to be processed is presented in Table 1.

Table 1. Sample of data format used for SNA.

Country	Collaborating Country	Amount of partnerships
Germany	Italy	1439
Germany	Spain	1011
Germany	United Kingdom	968
Italy	Spain	1750
Italy	Turkey	1573
Italy	Poland	1530

In order to achieve the aim of the research, the SNA was chosen to analyse the Comenius data. By using SNA ‘to look at community structures can give us a new perspective, new insights, richer understanding’ (Giuffre, 2013, p. 2) of how the data are connected to each other. Thus, the data were processed in accordance with the SNA theory, which has in its centre the relations and the patterns formed by these relations (Marin & Wellman, 2011). A social network is described by Marin and Wellman (2011, p. 11) as ‘a set of socially relevant nodes connected by one or more relations’.

The number of relations between two nodes is crucial in the SNA. In social media networks like Facebook, where we have to analyse a group of friends, each person either has or does not have a connection with another person. This is a binary connection, meaning that it either exists or not. On the other hand, in Comenius partnerships the focus is not on the existence of the relation. The specificity in the Comenius network was revealed by examining the extent to which each country collaborated with each other country. The findings indicated that schools from every country collaborated with schools from almost every other country participating in the LLP. This shows that the network is almost fully connected. However, the number of collaborations varies between countries. Therefore, in the network analysis the focus is on the weight (number of collaborations) of the ties. To be able to do such an analysis, a specific software which takes into account the weight of ties was used. This software was tnet (Opsahl, 2009) which specializes in analysing social networks and can analyse weighted networks.

A number of SNA indicators calculated in order to study the partnerships’ data such as shortest path, betweenness and closeness centrality. A fundamental concept in network analysis is the shortest path of nodes and edges that links two given nodes (Newman, 2001). The calculation of the shortest path even if it is not of interest in itself, is the key component of a number of measures (Opsahl, 2009), such as betweenness. In order to calcu-

late the shortest path in the weighted network, the Dijkstra's (1959) algorithm that sum the cost of connections and find the path of least resistance was used. Before the calculation of Dijkstra's algorithm, the weights of the ties were normalized by the average weight in the network as suggested by Opsahl (2009). A way to look 'at each node's position in the network with regard to the ways in which that node is the link other nodes' (Giuffre, 2013, p. 138) is by using betweenness centrality which is defined as the total number of shortest paths between pair of nodes that pass through a certain node (Newman, 2001). Typically, a node with a high value of betweenness centrality is most influential in the network and controls the flow of information that passes through it (Pryke, 2012). Betweenness centrality can be calculated using Freeman's (1978) algorithm in binary networks, without weight in its ties. Brandes (2001) proposed a faster algorithm to measure betweenness centrality that takes into account the weighted network but fails to consider the number of ties on paths. Opsahl, Agneessens, and Skvoretz (2010) have expanded these algorithms and the network for Comenius partnerships was calculated based on their proposal. The closeness measure focuses on how close a node is to all other nodes in the network. The intent is that a node is central if it can quickly interact with all others. A central node does not need to rely on other nodes interaction, since it is tied to all others and can reach them quickly (Wasserman & Faust, 1994). A main limitation of closeness is the lack of applicability to networks with disconnected components where two nodes that belong to different components do not have a finite distance between them (Borgatti, 2005; Opsahl et al., 2010). That limitation does not affect the current network because, as it was described in the previous section, it is well connected with an average of 30.5 connections per country.

Same as the betweenness centrality, the measures of the shortest path based on Dijkstra's (1959) algorithm are used. The process of calculating closeness as described by Opsahl et al. (2010) is first to find the total distance of the paths from a node to all others. That distance is the measure of farness. Then, the number is inverted to have the closeness. Thus, low closeness means the node is not close to other nodes and high closeness means the node is very close to other nodes. Furthermore, Gephi software was used to visualize the network transformed by Comenius Partnerships in two ways. The first is about the network in the countries level. The second is focused on partners and how each school experienced its participation in Comenius projects.

Finally, the SNA analysis is complemented by studying the partnerships' topics, the type of participating schools and the mobilities each country did for students and teachers.

Findings

The main objective of this chapter is to present the main findings which cover the analysis of Comenius multilateral partnerships under LLP data.

Comenius School Partnerships summary

The first section presents an overview of the Comenius School Partnerships. More specifically, table 2 presents the summary for Comenius Multilateral School Partnerships for the period 2007-2013 under the LLP. It should be noted that 2007 was a transitional year for Comenius School Partnerships, hence, Data for 2007 are not entirely comparable with the figures for 2008 and onwards (European Commission, 2012). The number of Comenius multilateral partnerships conducted under the LLP was constantly slightly above 1 000 per year (Table 3). Based on the completed projects registered in the EST, the total number of partnerships amounts to 6 516. Only 113 were registered for 2007, because it was a pilot year for partnerships in EST and only selected projects by NAs were included in the database (Indire, 2013).

Table 2. Summary for Comenius Multilateral School Partnerships.

Total Partnerships	6516
Schools involved	33323
Average partners per partnership	5
Average partnerships per country	958
Percent participation as coordinators per country	18%
Average partnerships in each country with other countries	155

Table 3. Distribution per year for Comenius school partnerships (2007 to 2013).

Year	2007	2008	2009	2010	2011	2012	2013
Completed Partnerships	113	1062	1070	1030	1070	1110	1061

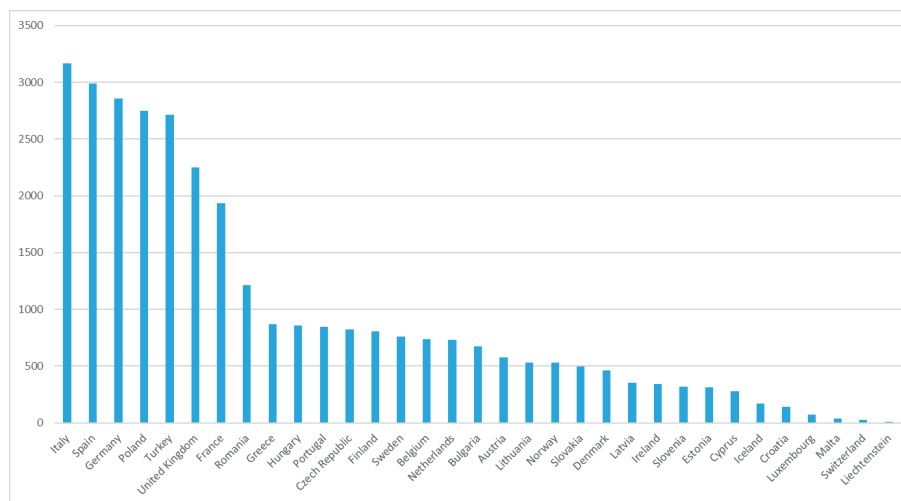
For these partnerships, 33 323 schools were funded from the EU. Until 2010 (there is no available information after 2010), the schools that applied for a Comenius school partnership were almost double in number than the ones finally approved for funding. In 2010 the number of applications received increased significantly. Applicants' success rates in securing funding, i.e. the number of proposals funded in relation to the applications submitted,

vary according to year and country and may be as low as 40 % or even less, as was the case in Bulgaria, Lithuania, Romania and Turkey (European Commission, 2012).

As seen in Figure 1, the countries with the highest participation in partnerships were Italy, Spain and Germany, followed by Poland, Turkey and UK. Compared with those countries, France presented a small number of participant schools in Comenius partnerships. In particular, the Italian schools participated in almost half of the total partnerships.

Almost every country had the same number of participants each year. The countries with the highest rate in participations noted a significant increase after the first two years and then stabilized. The UK seems to follow the opposite trend but not because of less interest by their schools. Up to 2009 the application success rate was about 70% (British Council, 2009). Every year there was more than a 10% increase in applications for school partnerships but at the same time the granted applications decreased starting from 550 in 2008 to 440 in 2013 (British Council, 2016). In the case of Turkey, the participation of schools in the Comenius partnerships is increasing every year with a marked increase in the last two years of the LLP.

Figure 1. The participations by country in Comenius school partnerships for 2007 to 2013.

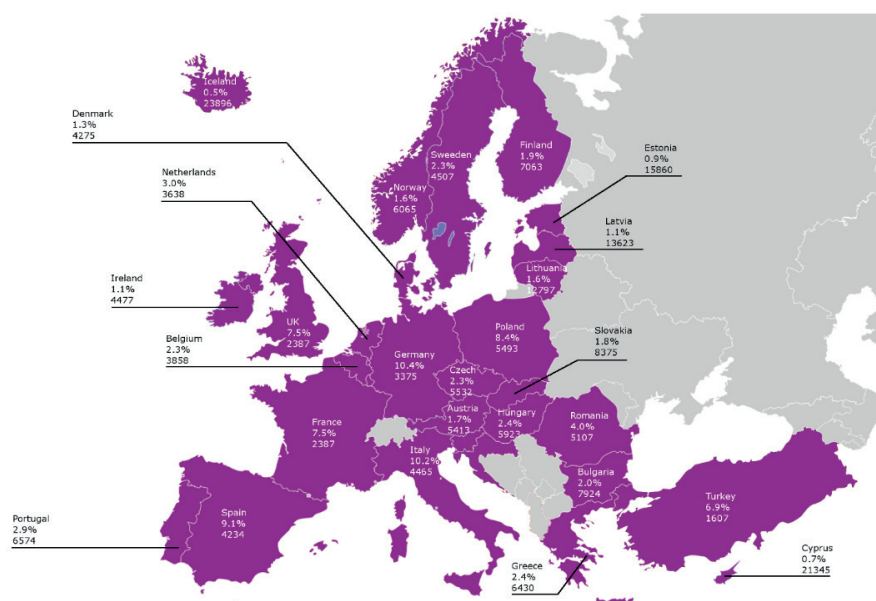


Participation in Comenius partnerships per country can be analysed by relating student population in each country with the total allocated budget for Comenius school partnerships. Figure 2 presents data regarding the 2007 – 2010 funding for bilateral and multilateral Comenius partnerships. Specifically, Figure 2 represents, for each country participating in the afore-men-

tioned partnerships, the percentage of the allocated Comenius funding as well as the budget (in Euros) which corresponds to one thousand students. The data regarding the funding was retrieved from the EU (European Commission, 2012) while the data regarding student population was retrieved from Eurostat (Eurostat, 2016).

Figure 2 indicates that Germany, which has the same student population as France, has a much higher allocated budget which results in an extra funding of 1,000 Euros per one thousand students. Italy, which has 25% fewer students than Germany, has almost the same budget which means that Italy, like Spain, spent more than 4,000 Euros per one thousand students. The countries with the highest budget for one thousand students are Iceland, Cyprus and Malta, followed by Estonia, Latvia, Lithuania and Slovenia. These countries have a significantly higher budget than the rest of the countries.

Figure 2. Budget allocation in proportion to student population.



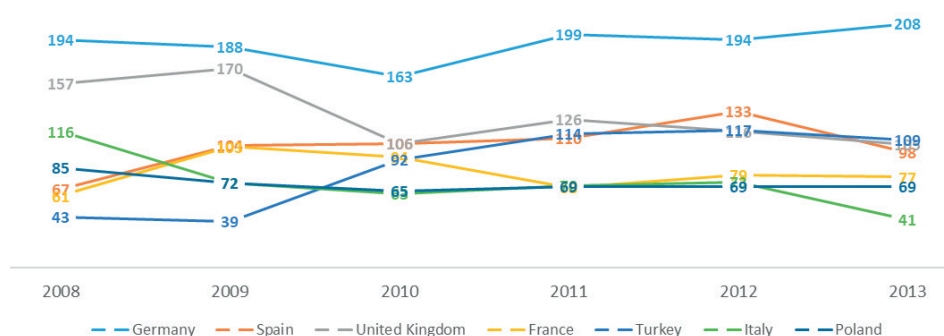
In relation to their population, countries like Austria and the Netherlands show low participation, while Finland, Cyprus, Estonia, Lithuania and Iceland show high rates of participation in proportion to their student population and their total allocated budget. Although Germany, the UK and France have a similar amount of student population, the participation in partnerships differs. The differences in funding could be a reason, although Italy and Spain, despite having lower funding have more participations than UK and France. However, countries could have differences on the kind of part-

nerships like the number of funded mobilities per partnership. This could explain in an extend the above results because when students participated to mobilities usually the funding for the school was almost double.

Coordinators

Next an analysis of the partnerships based on the coordinators will be presented. The school partner with the role of the coordinator is crucial in a partnership as it usually has control over the other partners. The coordinator is usually responsible for writing the application and arranging the work to be done by all partners. Based on the EST data, Figure 3 shows the countries with most schools having the role of coordinators in Comenius partnerships.

Figure 3. Number of coordinators per country.

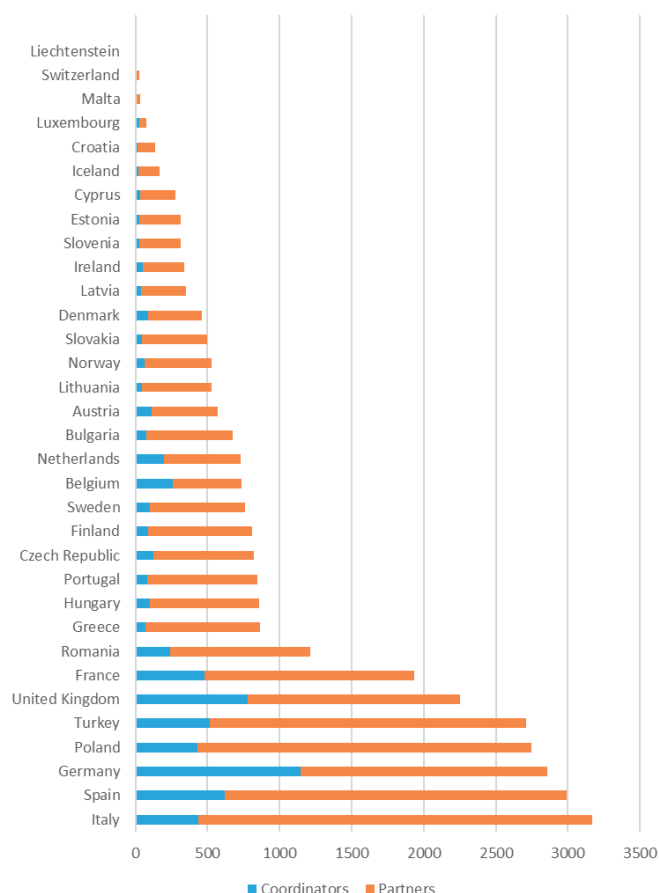


The first observation from Figure 3 is that Germany has by far the most schools with a coordinating role in the partnerships every year. The second observation is about the case of Italy, which is missing from the top rates of the coordinators despite the fact that Italy has the highest participation in school partners among all other countries. As shown in Figure 3, Italy's participation as coordinator in partnerships significantly decreased. Another interesting view of the data is the comparison of Turkey and UK which followed an opposite course in taking the leading role. Turkey demonstrated a sharp rise in 2010 as they went from about 40 schools with a coordinating role to 92, climbing to over 100 by 2011. On the contrary, the UK went the opposite direction, where numerous schools assumed a coordinating role between 2008-2009, but their number sharply decreased from 2010 and after. In 2012 and 2013 there is a match in the number of coordinators between Turkey and UK.

Besides the absolute values in coordinators per country, it is interesting to study the percentage of coordinators compared with the total partic-

ipations for each country. The countries with the highest proportion were Liechtenstein, Germany, Luxembourg, Belgium and Great Britain (Figure 4).

Figure 4. Number of coordinating schools within total number of participating schools.



Social Network Analysis (SNA) in depth

Liechtenstein and Luxembourg had very few participations but with a leading role in them. Austria and the Netherlands which both had, as a proportion of the population of their countries, participated in a small number of partnerships had one in five schools at a coordinating role.

In Romania, during the first two years of the LLP, only 11% of their participations had the role of the coordinator. Then, from 2010, that percentage started climbing to over 20%. On the other hand, the UK started with 40% in the first two years but then had a steady decrease every year falling to 30%

in 2013. Turkey had an average of 19%, but its distribution per year varied greatly. Starting with a 11% for the first two years, it jumped to 27% in the fourth year. During the last two years of the LLP it seems to have stabilized at 20%. On the contrary, Greece and Lithuania show very small percentages with just 8% of schools participating in Comenius partnerships as coordinators. The case of Greece is interesting because up to 2009 the percentage of coordinating schools was over 15%, which is close to the EU average. However, since 2010 the average proportion has fallen to 4% when at the same time the amount of schools which participate to the partnerships has increased. Once more Italy rings a bell as it has on the last year of LLP a similar low average proportion with Greece.

Table 4 presents a summary of some of the basic results for the studied network. As discussed before, almost every node in the network is connected with each other. That is shown from the mean value of the collaboration per country that is 30.5 which shows that it is not possible to extract meaningful data if we ignore the number of collaborations (weight) per connection (tie).

Table 4. Key figures.

Total number of countries (nodes)	33
Mean collaboration per country (different countries)	30.5
Mean Shortest path	3.18
Diameter (longest path in the network)	29.38

Figure 5. Map of the most connected countries within the Comenius partnerships network.

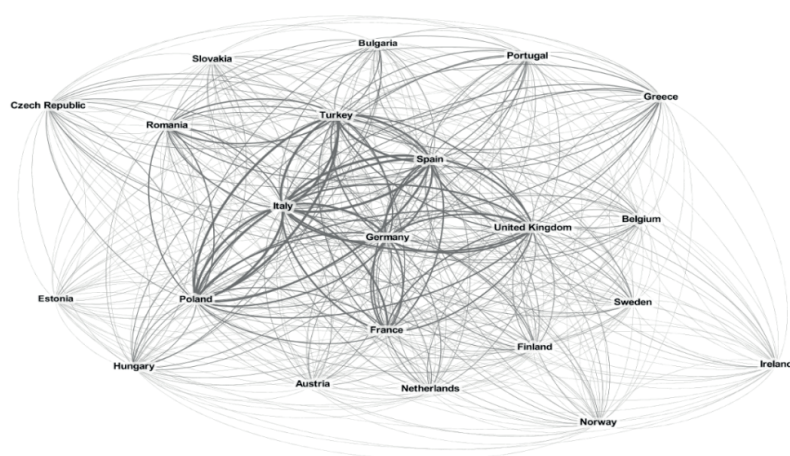


Figure 5 reflects the relationships among the countries drawn in a graph (created with Gephi 0.9.1). The thickness of the lines depends on the weight of the ties. At the core are the countries which interact more with each other such as Italy, Germany, Poland, Spain and Turkey. Romania is very close to the center with a strong connection with all other countries. Bulgaria, Portugal and Greece are connected with the central countries while other countries have a greater dispersion in their collaborations.

Shortest Path

The average shortest path of the network is 3.18. This represents that on average each country is 3.18 steps with average tie weight away from each other. A step is a unit of distance that refers to the average weight in the network (Opsahl, 2009).

The shortest path allows us to estimate the strength of connections between countries. The smaller value in the shortest path between countries signifies a stronger connection established for the schools of those countries. By calculating the shortest path, a first impression of the connection between schools in Comenius Partnerships is given.

Schools from most of the countries involved have strong ties with the majority of other countries as they have a shortest path of less than 2. However, the mean value is influenced by a small number of countries which have shortest path greater than 20. The main reason for this value is that those countries have joined a small number of partnerships and for that reason, they have few connections with other countries (eg. Switzerland, Liechtenstein). The above explains the so much high value of the diameter that is 29.38 which is the longest path in the network, when the mean shortest path is less than 4.

Betweenness (weighted undirected network of countries)

Looking closer to SNA analysis, the betweenness measures gives a clearer view of the importance of each country (tab. 5). Only six countries handle the connection among the 33 countries that participates to LLP and two of them are distinguished with a betweenness value much higher than the others. Clearly, Germany and Italy are the most central countries in Comenius Partnerships, while all these six countries have an advanced role in the partnerships. These countries are the ones that connected to a wider range of partnerships and lie on the shortest path between other countries.

Moreover, a further element of the role of these countries in the network is that almost all of the partnerships have as a partner at least one school from the countries in Table 5.

Table 5. Betweenness centrality.

Country	Value
Germany	123.0
Italy	115.5
Spain	37.5
Turkey	26.0
Poland	15.0
United Kingdom	15.0

The betweenness measure highlights the importance of the countries that influence mostly the less connected countries in the Comenius partnership like Liechtenstein, Luxembourg, Switzerland and Malta (Borgatti, 2005). Furthermore, the countries with high betweenness value are most likely to be funnelling information in the network to those countries (Opsahl et al., 2010).

Closeness Centrality

From the results of Closeness Centrality measures (Table 6), the countries with the highest participation in partnerships are stronger networked and they are more likely to collaborate with most other countries. Furthermore, the countries with low closeness value are well positioned to obtain first new information (Borgatti, 2005)

Table 6. Highest closeness centrality for countries.

Country	Closeness
Italy	0.039315809
Spain	0.038214879
Germany	0.037986954
Poland	0.036939137
Turkey	0.036580095
United Kingdom	0.035640958
France	0.032410401
Romania	0.030173472

The differences with the betweenness measure is that in closeness, Italy has the highest value, which verifies the central role that Italian schools have in Comenius partnerships. Another fact that arises from the closeness

measure is that Spain has the second highest value and its schools are well networked, while Germany has the third highest closeness. The results seem to corroborate what Opsahl et al. (2010) stated that “closeness is generally restricted to nodes within the largest component of a network”.

Again, the countries with a betweenness value have the top values in closeness as well. From the rest of the countries, France and Romania have a high closeness value, and whose role in partnerships should be taken into consideration.

Participation among countries

In this section the networks created with the greatest frequency for each country are studied. The current task was demanding as the EST provided the countries that involved in each partnerships but an algorithm was needed to combine them and produce the most common collaborations. The approach that was followed is described below.

In order to better understand the networks between schools, each country's most frequent partner country was located, unveiling the most common collaborations between countries. Then, the two most popular countries for completing each country's most common collaboration was sought.

The first observation is that there are few different collaborations among countries. In the case of the two most popular countries, one in four countries usually have in their partnerships schools from Turkey and Poland, whereas half of the countries usually collaborates with one of Germany-Italy, Italy-Spain or Turkey-Italy combinations. Another Interesting fact is that most of the countries have Italy among the countries that they usually do partnerships with.

At the case of collaborations among three countries the results remain in the same direction. Schools from eleven countries prefer to join partnerships that consist of schools from Italy, Poland and Turkey. Schools from seven other countries joined projects with schools from Italy, Poland and Spain. The above seem to suggest, that the Italy - Poland pair collaborates with most countries. On the contrary, only seven out of 33 countries have among their preferred partners schools from Germany.

Focus in partners

So far the discussion was focused in the relationships between countries. At this section the focus will be on partners and how each school experienced its participation in Comenius projects.

Table 7 shows some statics that will aid understanding the sections that follow. During the 5 years that the LLP lasted, 28 266 schools from all over

the EU¹ participated in Comenius partnerships. The average participation for each organization was 1.2 projects, meaning that most schools participated to only one Comenius partnership. The maximum participation to partnerships per school was 9 projects.

Table 7. Figures about partners.

Mean participate in partnerships per school	1.20
Distinct partners	28 266
Maximum participation per school	9
Mean topic references	2.9
Mean partners per partnership	5

Figure 7. The partnerships network.

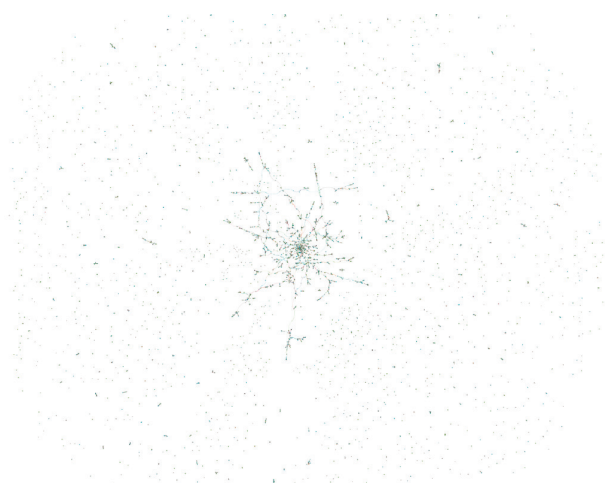
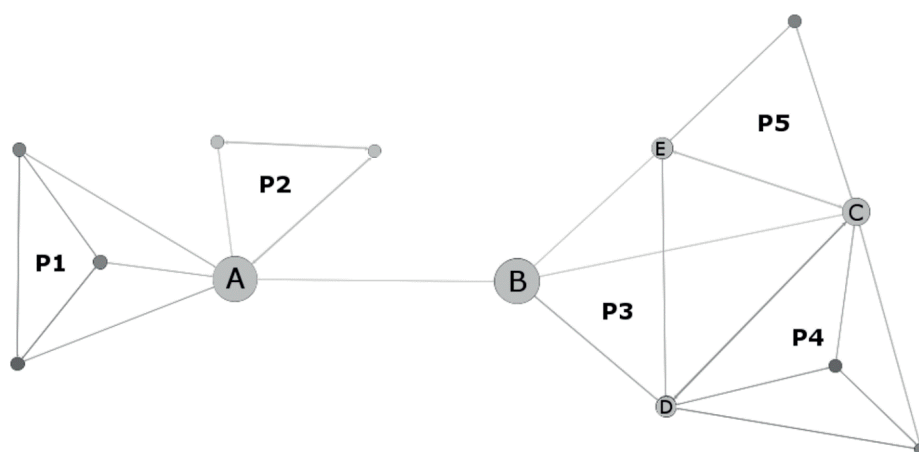


Figure 7 shows the network created by the partnerships. Each point represents a school. The dots that are peripheral to the graph represent partnerships (points are so close that seems like one dot) where none of its schools were connected to other partnerships. In some cases, there is an internal network with a second partnership containing some of the schools of the original partnership but again there is no connection with other partnerships. Only a small number of schools, located in the core of the graph participated in more than one partnership with new partners, creating links between partnerships.

¹ The reference to EU like the official European Union papers for the LLP is including the following countries: the 27 EU Member States and Iceland, Liechtenstein, Norway, Turkey, Croatia and Switzerland.

Figure 8. Relations of five partnerships.



There is a core of schools that participated in multiple partnerships, which are linked together. A snapshot in magnification is reflected on Figure 8 in which five partnerships are displayed. The nodes with letters A to E are schools which took part in more than one partnership. Node labelled as C participated in three partnerships, whereas nodes labelled as D & E participated at two partnerships. The nodes without label have participated in only one partnership. The nodes A and B have crucial role in the graph as not only did they participate in multiple partnerships, but were intermediates to other partnerships too. If for example the B node is removed from the graph, then there will be no connection between P3, P4 and P5 with P1 and P2 partnerships.

Schools from the Netherlands have the maximum average of participations in Comenius partnerships. The countries which have their school participate again in partnerships are shown in Table 8. Among the countries with the highest participation in school partnerships, German and United Kingdom's schools had participated more in multiple partnerships.

On the contrary, Turkey, Italy and France may have multiple participations in partnerships but their schools do not get involved in another European programme – as far as Comenius Programme is concerned (Table 9). Greece has the smallest average in projects per school but this is explained by the restrictions set by their NA, where a school could only apply for a second project after the first was successfully completed. This meant that only schools that started their first partnerships in 2008 or 2009 could have the option to apply for a second one. This was a strategic decision by the Greek NA which wanted more schools to participate in Comenius partner-

ships. Germany had a different approach in that a school could join multiple projects even in the same year.

Table 8: Average partnerships per school (max values).

Country	Value
Netherlands	1.56
Luxembourg	1.54
Germany	1.39
Norway	1.37
Hungary	1.34
Iceland	1.34
Finland	1.32

Another aspect of the participation in multiple partnerships is the role of the contact person (the person responsible to contact other partners and the NA). In Turkey, even in cases where a school participates into a new partnership, the contact person is different. Conversely, in Italy there are enhanced probabilities that the contact person will be the same person in any new partnership as half of the schools which participated in several partnerships had the same contact person.

Table 9: Average partnerships per school (min values).

Country	Value
Romania	1.09
Cyprus	1.08
Switzerland	1.08
Italy	1.07
Slovenia	1.06
Greece	1.02
Turkey	1.02

The largest percentage of participations by the same person as the contact person can be found in Belgium, Germany, the Netherlands and Bulgaria with over 60%, followed by Poland and Hungary with 53% and the United Kingdom with 50%. In these cases, it seems that schools are based on specific teachers to participate in new partnerships. If that person is not available or moves to another organization, then the school might not join other projects.

Another aspect of re-participating in partnerships for schools is if they repeat the exact same partner mix as their first effort. Out of the 28 266 schools participating in Comenius partnerships, only 3 896 were involved in at least two partnerships. The vast majority (60%) of schools participated in another partnership without a school from their previous project. Most other schools participated in new partnerships with a 10 to 30% shared partners.

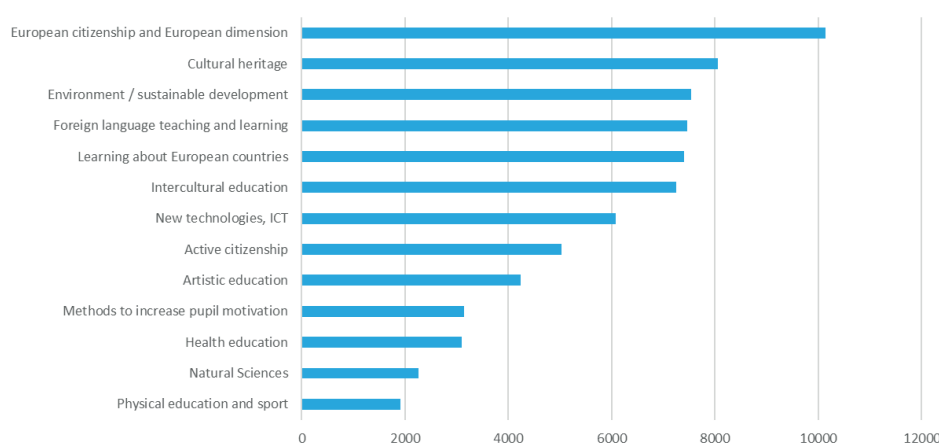
Note that only 14% of schools participated in a second partnership and the possibility to cooperate with some of the schools in a second partnership is 40%. Finally, it is unlikely to establish a new partnership with exactly the same partners.

Analysis based on topic

In this section the partnerships are studied based on their topic. In order to verify the choice of the topics from the partnerships, approximately 10% per year of the total school partnerships were randomly chosen. The sample was used to check the choice of topics for each partnership based on the description of the partnership. The analysis of the sample verified the chosen topics to at least 90%.

Figure 9, shows the topic referenced by the partnerships. The majority of partnerships related to *European citizenship and European dimension* which implies that they take the two-year collaboration between schools from various European countries as a way to promote the European identity.

Figure 9. Topics related to partnerships.



From the schools that participated in two or more partnerships (total 3 966) only 170 partly chose the same subject area in their next collaborations.

However, most of the partnerships chose topics among a limited number of options.

Analysis based on school type

Looking back to the partnerships, there is mostly participation from secondary schools, followed by primary and vocational schools. Other types of school as pre-school education, education for people with special needs and mixed school types presented low participation. Moreover, almost half of the partnerships consist of two types of schools and one in three partnerships comprised of only a single school type. Three different types of schools are found in a smaller percentage of partnerships.

Secondary and Primary schools are involved in partnerships with only or mainly with the same type of schools, while vocational and special needs schools are joining partnerships where the majority of schools belong to different type.

The most frequent type of partnerships is between secondary and primary schools and between secondary and vocational schools.

Furthermore, secondary and primary schools have usually the role of coordinator. The schools for people with special needs, although they have few participations in partnerships, take the role of coordinator in almost half of their participations.

Mobilities

There are two different behaviour patterns among countries. First, there are countries like Germany, France, Luxemburg and the Netherlands that realised about two times more student mobilities than teacher mobilities. All other countries realised almost an equal number of mobilities for students and teachers. Although Italy participated in more partnerships than Germany, it has less mobilities. However, the main reason that Italy lacks mobilities is because Germany had more pupil mobilities whereas Italy had the most teacher mobilities among all other countries.

Finally, most of the countries realised most of their mobilities in Germany. Among other popular destinations were Italy, Spain and UK.

Conclusions

The EST has, for the first time, provided a unique collection of data regarding school partnerships which until now could only be retrieved from each NA, thus, making it almost impossible to have an overall picture. The prospective analysis revealed that the Comenius programme, as part of the LLP, attracted the interest of schools in the EU and if the available funding

budget had been higher, twice as many schools (33,000 schools were actually funded) would have participated in school partnerships. This led many countries to reject high quality applications due to limited funds (Public Policy and Management Institute, 2011a).

When looking into the countries' population in order to compare each country's participation, it became apparent that the countries with the largest population have a higher degree of participation. However, France, which has almost the same population as Italy, has 30% less participation than Italy. Accordingly, the results were similar when investigating the countries' population and the EU funding provided, as NAs allocate the LLP budget to the Comenius actions differently. A further explanation is that certain target groups are not aware that they are eligible for funding under the Comenius programme. For instance, in France, language teachers usually do not know about such opportunities and special needs schools barely participate in Comenius actions (Public Policy and Management Institute, 2011a). The EST data also provided information about the role the schools in each country have in the partnerships. The data revealed interesting results. For instance, Comenius school partnerships have a proven impact mostly on coordinators' organizational competences (Ciep, 2012). Germany has by far the most schools with a coordinating role in the partnerships every year which may indicate the leading role of Germany's schools in Comenius partnerships, whereas Greece has the smallest proportion of schools assuming the role of the coordinator. Italy is another case providing interesting results. As Italy had the most schools participating in Comenius partnerships, one would have expected it to have a similar percentage in coordinator positions. On the contrary, Italy had, especially in the last year of LLP, one of the lowest percentages of coordinators among EU countries. These contradictory numbers between being a mere partner and a coordinator seem to suggest that the Italian schools are familiar with European programmes but do not wish to take the lead. This behaviour might derive from the lack of language skills which creates an additional barrier as English language teachers comprise the largest group of participants from Italy in the Comenius programme (Public Policy and Management Institute, 2011a). However, this indicator needs to be further studied in future research. The analysis of the EST data has provided the basis to make the calculations about partnership composition and the patterns that are being formed. Firstly, it is important to mention that the criteria for each country to join a partnership varies and should be individually examined in detail, e.g. Estonia had the UK as a favourite destination country among LLP mobilities as it is a nearby country (Kirss, 2010) and Finland's coordinators complained about the inequality of financial resources especially for the long travelling distances (Puukko, Roisko, & Sallinen, 2010). Nevertheless, most partnerships consisted of the

same combination of countries. Half of the countries joined partnerships with countries from Italy, Poland and either Turkey or Spain. In accordance with Ciepiński's (2012) study where the exchanges and activities carried out with European partners arouse pupils' interest in other European countries and their cultures, the above four countries extend their influence, as students and teachers from these countries travel to the rest of Europe, getting familiar and better understanding the European culture while simultaneously teachers and students from European countries are getting familiar with these four civilizations. Moreover, Italian schools might have had a more positive effect as they were mostly preferred for collaboration from almost every country that participated in the Comenius partnerships. The use of the SNA theory helped to better understand how partnerships were formed and how schools functioned within these partnerships. The study showed that, regarding the 33 countries which participated in the Comenius Programme, all countries formed at least one partnership with each other. Moreover, the study indicated that, within these partnerships, the majority of the countries involved formed strong ties with each other. Taking this and the previously presented results into consideration, Comenius projects managed to connect the participating countries, establishing strong ties among them which usually corresponds to a positive appraisal of the projects' impact on the school's international dimension, the introduction of innovative approaches into the school's curriculum and the school management (GES, 2007a). Looking closer into the SNA analysis, it appears that the betweenness measure indicates the central role of just six countries in Comenius partnerships, which seem to pass on best practices to the less connected countries more easily. In Comenius partnerships this was achieved mostly by schools from Germany and Italy.

On the contrary the closeness measure indicates the countries that are more likely to collaborate with most other countries. Italy has one more time the lead in this measure which verifies the central role that Italian schools have in Comenius partnerships, followed by Spain and Germany. This element should be taken into high consideration as the degree to which best practices are disseminated affects the impact that projects have on school environment (Ciepiński, 2012).

Interesting results came up when focusing on the schools that form the partnerships. With an average of 1.2 Comenius partnerships per school, LLP gave the opportunity to a lot of schools to participate in Comenius multi-lateral partnerships. However, most schools did not participate in further Comenius partnerships. This observation is important because, according to GES (2007a, p. 7), "schools' previous experiences with international cooperation and the length of a country's eligibility to take part in Comenius may play an important role" on the impact of Comenius on pupils, teachers and

the school environment. Among the countries with the highest participation only Germany showed a high range of continuation in Comenius projects. On the contrary, Italy has one of the lowest rate in continuation, despite the fact that it has the most participants in Comenius partnerships. The same observation was made for Turkey and Romania. Based on the fact that the majority of schools intended to submit a new application (Ciep, 2012), the low level of continuation could be the result of NAs policies as is the case with Greece and Italy which wanted to maintain a constant turnover among the beneficiary schools (Public Policy and Management Institute, 2011a). The fact remains that further cooperation at an institutional level rarely occurs at the end of the Comenius project (GES, 2007b). However, a question arises: 'Is it better to allow more schools to participate in EU projects or give incentives to schools to participate again?'. To answer this question we have to keep in mind that for many schools, participation in the Comenius provides the only opportunity to travel abroad as part of an exchange project (Ciep, 2012). Moreover, the interim evaluation of the LLP revealed that an alternative cooperation outside the LLP programme would be more fragmented and multilateral partnerships would not take place to the same extent (Public Policy and Management Institute, 2011b). In order to respond, more data is needed and subsequent research should be performed. In the cases where the schools participated in more than one partnership, the visualization graph looked like a spider's web revealing that when schools participate in more partnerships then tend to extend their connections bringing along their previous experience. In addition to the previous point, schools that decide to participate again in another partnership prefer to do it with new partners and extend their acquaintances. The participation in multiple partnerships brings up an interesting question: 'Is it the school as an organization or the contact person that promotes the continuation of participation?'. Studying the cases of schools with multiple participations the answer is rather obvious as the majority has the same contact person for most of the projects. That might be as a result of the many specialised competences, such as language and computer skills, required from the teachers in order to participate in a project (Ciep, 2012; Cook, 2012). As far as the topics of the partnerships are concerned, the schools focused mostly in learning more about Europe. Moreover, schools which participated in a second or more partnerships selected a different subject to work on. This implies that schools that participated in a school partnership for a second time did not remain attached to the same theme, but were open to new ideas. Again, the alternation in project themes lead to a school's openness to its environment as schools actively seek out new partnerships with local associations, specialised institutions and companies (Ciep, 2012). Furthermore, the interim evaluation in Finland estimated that Comenius projects have promoted the horizontal policies

(Puukko et al., 2010). In Comenius school partnerships, all kinds of schools participated but the majority of them were secondary schools, followed by primary schools. The interesting observation here is that most partnerships include more than one type of schools, with the most common combination being secondary schools working together with primary schools. This means that Comenius partnerships gave the opportunity to schools to collaborate with other types of schools.

Finally, the “Statistics for all” database provided useful information regarding the mobilities that took place in each country for students and teachers. Taking into consideration that the pupil mobility significantly increases project impact in school community (Ciep, 2012), the proportion of mobilities for teachers and pupils might be an indicator for the perspective that every country has for the partnerships: when there are much more mobilities for students, then that might be a sign that the country considers students the main beneficiaries of the programme, while, when there are equal mobilities for students and educational staff, then most probably, these countries perceive partnerships as a tool to further educate their teaching staff.

The researcher faced certain limitations in the process of collecting the data regarding Comenius partnerships. Firstly, the information regarding the partnerships were retrieved from EST. However, there are a number of partnerships that are not presented on EST, specifically those that started in 2007. Another limitation was that information regarding mobilities concerned only a small number of countries. It should also be noted that this information was available until 2010. Despite the limitations, however, the current study presents a detailed analysis of the partnership networks and partner mix. Further studies could focus on how different stakeholders understand mobilities and the impact of the gained experience on school practice. At an initial stage, what could be studied is how schools perceive mobility, while later studies could conduct in-depth analyses of how separate countries or NAs understand mobilities. At a later stage, comparative analyses of how separate stakeholders perceive these mobilities could unveil ways for the EU to design better programmes catering for the needs of all countries involved.

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