www.rigeo.org ISSN: 2146-0353
RIGE
Review of International Geographical Education Online
Review of International Geographical Education Online ©RIGEO Volume 4, Number 2, Summer 2014

Experiential In-service Teachers' Training for the Pilot of the New Geography Curriculum in Greece: A Different Experience with Tangible Results

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Abstract

The aim of this paper is to present the design and the results of the In-service Elementary Teacher (IET) training seminars, in Geography for primary education, during the pilot of the New Geography Curriculum (NGC) in Greek schools, the school year 2011-2012. The design of this training was based on the documented needs of teachers for training in a practical and experiential way and to meet with teamwork. Teachers, who participated in these training sessions, reviewed positively the experiential nature of the training courses, created 36 new Geography lesson plans on a voluntary basis, and most of them incorporated tools and teaching methods they had experienced in the seminars. These results could provide guidance for a successful in-service teacher training course in all subjects and not just for Geography.

Keywords: In-service training, primary education, teachers, geography curriculum, Greece

Introduction

New Geography Curriculum (NGC) in Primary Education

Geography as a school subject, in the Greek educational system, suffers from the preconception of being a boring, descriptive teaching subject - vast in scope - that contains concepts, numbers and names that should be memorized and identified on maps (Lambrinos, et al. 2002; Klonari & Koutsopoulos, 2005). This perception originates from the early school age and, unfortunately, does not soften with time.

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However, nowadays more than ever, humanity is facing a variety of issues, with a strong geographical dimension, such as population dynamics, inequalities in alimentation, urbanization, socio-economic disparities, poverty, unemployment, refugee problems, human rights violations, diseases, criminality, racial discrimination, immigration, environmental degradation and depletion of natural resources. These issues, which strongly affect modern life, show the dynamic relationship and interaction between space, human activities and environment. In other words, it is shown that the content of Geography curricula must be closely linked with the development of spatial thinking and the development of students' spatial skills.

Therefore, a key feature of the NGC is the development of students' spatial thinking. According to Goodchild (2006), communication depends on the spatial literacy of the person i.e. "a set of abilities related to working and reasoning in a spatial world that allow us to comprehend maps, pictures and spatial data, the same way we are taught to understand numbers, texts and logic". Hespanha, Goodchild & Janelle (2009), argued that "learning to think spatially means that someone must have: spatial knowledge of concepts, spatial ways of thinking and acting – including knowing how, where and when to use the various spatial thinking strategies and spatial capabilities, such as the ability to use tools and technologies to help in problem solving and making decisions". Lee & Bednarz (2009) consider as spatial abilities the spatial visualization of manipulating information, spatial orientation, the interpretation of spatial distribution and patterns, the connection and correlation of locations and places, the comprehension of spatial hierarchies and orientation in the real world. The spatial abilities of students are equally developed through activities related to concept maps, drawing maps, and comparisons of various thematic data layers.

Another key feature of the NGC is the use of multimedia, and especially the use of various types of applications of information and communication technologies (ICT). Nowadays, there are a variety of teaching tools available, such as GIS, virtual Globes, internet, educational software, hypermedia, and other visual environments, simulations-visualizations, etc. (Lemberg & Stoltman, 1999). The use of ICT in teaching Geography is necessary for the following reasons: 1. They concretize abstract concepts and procedures that do not directly attract the attention of students. 2. They enable students to observe the general image and details of a large area, even the whole of the Earth. 3. They enrich teaching, making it more interesting and motivating involvement with various geographical issues. 4. They facilitate students in their search for information on a variety of geographical topics. 5. They facilitate the linking of geographical issues to knowledge in other subject areas and thus promote interdisciplinarity. 6. They enable students to understand directly the impact certain phenomena or facts have on humankind (e.g. the consequences of flooding on our lives) (Taylor, 2001; National Research Council, 2006; Condie, et al. 2007).

The third key feature of NGC is the adoption of a variety of teaching methods in practice, such as inquiry activities, teamwork and experiential approaches, including field work (Lee & Butler-Songer, 2003; Marble, 2007; Bell, et al. 2010). In this way,

active and student-centered learning is consistently promoted (Minstrell & Van Zee, 2000). Moreover, very important social skills developed through collaboration and inquiry-based learning, such as expression, synthesis, argumentation and documentation of personal opinions, ability for observations and conclusion formulation (Rogers, 1998). In addition, the ability to apply knowledge and make interconnections with facts and events of everyday life is one of the modern demands of teaching every subject (Chalkia, 2010). Some studies, except of finding out the general perception of geography, are focused on pointing out the differences in the perception of geography between boys and girls. The gender is the most often investigated variable. For example Okuranstifa (1975), Sack & Petersen (1998) or Ozdemir (2012) found out more positive perception of geography by boys in comparison with girls. The next variable, which was investigated, is the age of respondents. Brook (1977) and Sack & Petersen (1998) showed the negative view of the geography by the age of respondents.

Concerning the Geography subject content, in the NGC is adopted the triple approach, which includes Physical Geography, Human Geography and Environmental Geography or Ecogeography (Katsikis, 2004). These content characteristics attempt to promote students' cartographic, visual and digital literacy. This approach allows students to be aware of the impact both personal and social behavior have in the environment and therefore to understand the complexity of the world at different levels and scales. Moreover, it provides them the opportunity to develop decision-making skills to issues concerning the natural environment and therefore develop an environmental ethic oriented to the rational management of natural resources and sustainable development.

Teachers' Geographical Studies in Greece

Greek primary and secondary school teachers are not required, unfortunately, to study a further course related to Geography during their studies. This can happen only by chance, if in the Department of Primary Education, where they study, there is someone among academic staff having specialty on Teaching Geography. During this academic year (2013-14) courses related to Geography in Education and Teaching Geography are offered in Pedagogical Department of Demokritio University (3 courses), in Pedagogical Department of Athens University, Aristotelian - Thessaloniki and Crete (2 courses), in Pedagogical Department of Patras and Ioannina only one course, whereas, in Thessaly, Western Macedonia and the Aegean University, there is no course in their curriculum about pure Geography or Geography teaching.

Teaching Geography in Greek Primary School

Regarding Greek teachers' views on the subject of Geography, one study showed that, while they consider this subject as useful, 48% of them say that they do not like it, do not want to teach it and would prefer to teach other subjects (Klonari, 2004, p. 603-610). Possible explanations for teachers' negative attitudes include:

Knowledge insufficiency
Bad experiences as students (learning by heart, being taught "chalk and talk" etc)
Lack of suitable teaching material

Lack of time for preparation

Most teachers in Greece ask for new teaching approaches that will support their educational needs in Geography education (Paraskevas, et al. 2010). It was precisely this desire that the trainers tried to meet when designed the 16 training seminars (workshops) for 43 teachers, in order to experience the methodological changes, proposed by the NGC in Primary Education. The seminars were designed from the beginning to involve teachers in teamwork and activities and these seminars applied in the same way throughout Greece (Athens, Thessaloniki, Patras, Veria, Sitia, and Nafpaktos) (Klonari, et al. 2014).

Design Training in NGC for Primary Education

In Greece, during the school year 2011-2012, the new curricula were introduced for pilot implementation, in all school subjects, in 99 primary schools. Taking the field of IET training on the subject of Geography for these schools, as a guide for planning the seminars, we used the educational experience of the trainers and the relevant literature. A result of these two pillars is the finding that IET wish to receive training in a practical rather than theoretical way. They express the need to apply what is presented to them and not try to find how to apply various theories in practice (Brand & Moore, 2011; Nelson & Davis, 2012). They would like to be trained in practices with which they are not very familiar, such as working in groups (Villegas-Reimers, 2003). They find significant enhancement of experience through active participation in activities and especially value experiential methods (Linn, 2003; Dean & Kuhn, 2006).

First choice in teacher Geography training seminars was working in groups, a practice that the majority of Greek teachers have rarely experienced in other training seminars. Teachers created their own groups (choosing the members of their own team) in which instructing activities were tasked through a worksheet. The teams implemented lesson plans exactly as they were written in the Teacher's Guidebook accompanying the NGC (http://ebooks.edu.gr/2013/newps.php). This choice served two objectives simultaneously. First, teachers themselves fell into student's position in order to develop the skill of empathy, realizing the difficulties in collaborative learning and in management of time required. Secondly, teachers were trained to implement a ready project, in order to take many ideas to design their own projects for different geographical issues.

Second choice was the purely practical and experiential nature of the training seminars without a theoretical introduction. Any references to theories were made at the end of the seminar in the context of discussion and reflection among teachers. The main objective was teachers' active participation, which was aimed by their continuous encouragement and motivation. The basic condition for this was the positive emotional atmosphere, for which trainers showed special care. One of the main characteristics of these training seminars was that the inquiry approach to learning contributed to the comprehension of teamwork teaching and to the use of differentiated teaching methods, as well as the suggested resources (maps, videos, texts, graphs, images, etc) which were documented in detail in the NGC. As a training model followed the pedagogical motto

"think, discuss, present" by assigning a specific task to each group, which was then presented and discussed in a plenary session (Sternberg & Spear-Swerling, 1996; Sternberg & Grigorenko, 2007).

A third choice was to focus on teachers' autonomy and creativity in designing and teaching pursued by the NGC. Therefore, after the implementation of each lesson plan following the instructions of Teacher's Guidebook, a new lesson plan was created by the teams. Teams suggested some activities on a particular topic and then planned one of these activities for presentation to the plenary, after a certain time. The disagreements between the groups, the effort to avoid duplication, the pressure of time and the variety in the presentation were the elements found in correspondence to the pupils' classroom. These elements were identified and discussed in the final reflection debate, together with reflections on teaching time, on alternative ways of evaluation, on the ability to empathize the pupils' position and teacher's autonomy limits. IET considered the uninterrupted distance communication they had with their trainers from the seminars to be important support offered for the pilot implementation, in the form of additional teaching materials and instructions. Through this kind of support every teacher felt as part of the learning community and developed their own autonomy and creativity.

Methodology

Research questions

This study has two research questions: a) teachers' general opinion on the training seminars, b) to what extent teachers adopted methodological features used in the training seminars (instructional tools, teaching strategies, basic characteristics of the NGC) into their own new lesson plans?

The Sample

99 pilot schools were chosen by the Pedagogical Institute (P.I) and the Ministry of Education, all over the country, in order to be representative for the implementation and evaluation of the new curricula in schools. Teachers from these schools (1200 in total) had to choose at least 3 subjects (from 11) to be trained in the new Curricula in training seminars. Finally, from all of these teachers only 86 chose to be trained in the New Geography Curriculum. The sample of our study constitutes 50% (43) of trained teachers, 16 of them being men and 27 women from 10 primary schools in urban, suburban and rural areas throughout Greece. They attended a total of 16 seminars in six Greek cities in three phases, an initial, an interim and a final phase.

Research Tools - Analysis of Data

The open-ended questionnaires and semi-structured interviews were qualitatively analyzed through content analysis (Stemler, 2001; Cohen, et al. 2007). Responses were classified into categories in order to response to the first research question.

The questionnaire contained four questions to be answered in Likert Scale and four open-ended questions. Concerning the analysis of the first ones, a proportional distribution based on a four degree scale has been followed. Afterwards, a differentiated

distribution based on the rationale of each answer has been established. Concerning the analysis of the four open-ended questions, they were classified into categories based on the content.

The interview was semi-structured. Each teacher had to answer eight (8) questions. Four (4) of them were based on a Likert Scale and four (4) were open-ended. Some subsequent questions could be possible, if it was necessary for clarification or explanation of the initial answer. The analysis of the data was similar to the questionnaire data, as described above.

Moreover, the 36 new lesson plans were analyzed through content analysis in a similar way as a discernible research tool. In particular, the used educational tools, the implemented methodological elements and the incorporated teaching practices were recorded and counted. Elements derived from this analysis were studied in order to response to the second research question.

Procedure

The new Geography Curriculum was implemented on a pilot basis during the school year 2011-2012. Special Geography mentors visited the schools, estimated the progress in the implementation of the new Geography Curriculum and supported the 43 teachers in multiple levels. In order to reliably achieve this, teachers completed an open-ended questionnaire and afterwards were interviewed by the mentors in a semi-structured way (see Appendix A and B).

The researchers and authors of this paper created both the questionnaire and the main plan of the interview and handed them to the sample. Afterwards, special Geography mentors collected from the sample the completed questionnaires and interviewed the teachers. Finally, the researchers studied the questionnaires and the interviews, classified the data and reached to conclusions.

We consider the validity and reliability of measurement tools as high, given a) the high proportion of the trained teachers in NGC all over Greece (50%) b) the representative sample covering the whole country c) the fact that the sample was chosen by official authorities and not by the researchers.

Results from Teachers' Training Seminars in NGC

The adoption of this approach into the training seminars for NGC for Primary Schools was enthusiastic, as implied by both the questionnaires completed by the teachers and of the features adopted in the new lesson plans they created.

Results

Primary school teachers' responses are evaluated with respect to four dimensions as follows:

1st research question

In the first dimension, 43 in-service elementary teachers, who completed the questionnaires during the evaluation process of pilot implementation of NGC in schools, expressed the usefulness of these training seminars as positive (Table 1). The majority of the IET (70%) stated that they familiarized adequately with the NGC goals and that there was a total correspondence between intended learning outcomes and activities proposed by the NGC, while the remaining 30% considered the correspondence to be "great". Teachers were also very satisfied with the Geography Teacher's Guidebook and found it very useful (93%), and 72% of them regarded that the experiential process of the seminars was also highly useful and effective.

Table 1.
Teachers' opinion on training seminars usefulness

Opinion on Geography training seminars usefulness	Number of teachers (N=43)	Percentage
Comprehension of Teacher's Guidebook	40	93%
Creating new lesson plans	39	91%
Highly useful seminars and experiential process	31	72%
Satisfactory familiarization with the goals of the new Geography Curriculum	30	70%
Total correspondence between intended learning outcomes and proposed activities	30	70%

Source: Authors' study data

According to the IET, the strengths of the Geography training seminars included the direct implementation of a variety of methods and tools (93%), the limited persistence in theoretical presentations (91%), the practicing in teamwork (72%), the use of differentiated teaching methods (70%) and the linking between theory and practice (81%) (Table 2). Moreover, the positive atmosphere (63%), the encouragement and the emphasis in active participation (79%), the suggested resources (65%) enhanced teachers' interest and strengthened their willingness to implement NGC in their own classrooms. In addition, the approach of basic concepts and teaching techniques, with which the majority of teachers are not yet very familiar, such as the inquiry based learning (67%), the development of group dynamics (58%), the interdisciplinarity (67%), and the development of goal-centered lesson plans (51%), contributed to the success of training seminars.

Table 2.
Teachers' opinion on positive characteristics of training seminars

Opinion on positive characteristics of training seminars	Number of teachers (N=43)	Percentage
Direct implementation of a variety of methods and tools	40	93%
The limited extent of theoretical presentations	39	91%
Linking theory and practice	35	81%
Active teachers' participation	34	79%
Understanding of teamwork	31	72%
The use of differentiated teaching methods	30	70%
Inquiry based learning	29	67%
Getting to know with suggested resources	28	65%
Positive emotional atmosphere	27	63%
Development of group dynamics	25	58%
Understanding interdisciplinarity	24	56%
Development of goal-centered lesson plans	22	51%

Source: Authors' study data

2nd research question

In the second dimension, 39 teachers (91% of the sample) created 36 new lesson plans, which are already accessible to the educational community, at https://www.dropbox.com/sh/d1wzi6e1v2zsv6s/yMy8URvGnS, in order to enhance the exchange of learning material among teachers. Moreover, these lesson plans constitute a useful research tool, which will reveal the extent to which the key features of the NGC have been grasped by the teachers.

It has to be noted that this was not a formal requirement of the trainees, but it was the result of both the success of the seminars and teachers' distance support by the trainers. With this kind of support every teacher felt as part of a learning community and was motivated to contribute in achieving common goals. The fact that teachers have created and implemented in their classes their own lesson plans (new ones) indicate, in a way, the success of training seminars, with tangible results, and their previous design.

In the third dimension, the content and the adoption of key features of the NGC in these 36 new lesson plans consists another criterion for the success of the training seminars. All teachers acknowledge the opportunities offered by the use of multiple audio-visual teaching tools, especially ICT in teaching Geography. The effort to use ICT was a great success, as ICT capabilities were integrated into 92% of new lesson plans. The majority of the teachers (81%) exploited applications like websites, Google Earth, video, weather forecast, interactive games, educational software and simulations. Lower frequencies were found in the use of maps (74%), images and photos (35%),

accompanying texts (33%), blank map for completion (21%), magazines and newspapers (14%), cards with symbols (12%), the globe (9%), tables & charts (7%) and others (Table 3). All the above educational tools have been utilized during the training seminars and it seems that teachers familiarized with them.

Table 3.
Identification of educational tools in the new lesson plans

Suggested visual material/tools in lesson plans	Number of teachers (N=43)	Percentage
ICT (websites, video, software etc)	35	81%
Maps	32	74%
Images-Photos-Satellite images	15	35%
Accompanying texts	14	33%
Blank map for completion	9	21%
Magazines-Newspapers	6	14%
Symbols	5	12%
Globes	4	9%
Tables-Graphs	3	7%

Source: Authors' study data

In the fourth dimension, all teachers considered the implementation of multiple teaching practices as implicit and desirable in Geography. This is why the vast majority (91%) has completely implemented them into the new lesson plans (Table 4). 84% of the IET constructed worksheets for pupils so as to motivate them as much as possible and avoid verbalism. 79% explicitly worked in groups, while others suggested this, even if they did not describe it explicitly. 74% put emphasis on the exploratory use of the map, including search and presentation of information, reasoning and problem solving. Despite the fact that all teachers reported various ways of student assessment, only 23% of them created specific evaluation sheets. Even so, we consider this result as encouraging, given that teachers usually use only a few oral questions in the evaluation phase. It is also worth mentioning that 21% of the teachers have submitted proposals for the extension of the lesson plans already created. This fact indicates that training seminars broadened their ways of thinking and imagination, reinforced their pedagogical freedom, and supported their creativity usually oppressed by the unique school textbook.

Table 4.
Identification of educational tools in the new lesson plans

Features of teaching Geography	Number of teachers (N=43)	Percentage
Multiple teaching practices	39	91%
Worksheets	36	84%
Collaborative learning, teamwork	34	79%
Inquiry-based learning	32	74%
Triple approach	24	56%
Spatial thinking	22	51%
Evaluation sheets	10	23%
Suggestions for expansion	9	21%
Field work	1	2%

Source: Authors' study data

On the other hand, only half of the teachers (51%) created activities for the development of pupils' spatial thinking. Very often they suggested data classifications, but without always looking for models or patterns of these classifications. In every lesson plan teachers asked pupils to locate places/data/events on the earth's surface, but not to find the links to other features or the reasons for these locations. The map is almost always used as a research tool, but not always as an inquiry tool for interpretation of distributions of sites or regions. It seems that the avoidance of the memorization of names and numbers and the development of pupils' spatial thinking is the most difficult goal of the NGC in Primary Education. Moreover, due to the young age of the pupils, this goal is becoming more difficult and requires the design of appropriate activities, for which the duration of training seminars seems that there was insufficient.

In the same way, it seems to be a lack of the development of activities based on the triple approach of Geography – Physical Geography, Human Geography and Environmental Geography – in spite of the educational requirement for an interdisciplinary approach. In fact, only 56% of the IET implemented this dimension in their new lesson plans. So far, teachers mostly used the memorizing facts, names and numbers in Physical Geography and it seems that the time spent in the other two perspectives in seminars was not sufficient to change so quickly this trend in teaching.

Fieldwork was very difficult to be integrated into Geography lesson plans, since it was suggested in only one new lesson plan (2%). We expected that teachers would adopt this practice more often, as it could contribute to orientation competences and development of spatial thinking. We assume that the limited use of the fieldwork is due to a) the limited teachers' experience in such activities, b) the unsuitability of the units developed, c) the lack of awareness of educational benefits and d) operational problems, safety issues, etc.

Finally, the variety of teaching practices featured in the 36 new lesson plans is exceptionally wide (Table 5). 70% of the IET created activities which utilized posters, artefacts, painting, drawing maps and creation of digital display. 53% created activities related to language and literature, formulating arguments; concept map construction etc. 49% suggested educational activities based on representations, painting or creation songs, role play, experiential games etc. Moreover, 42% of teachers created activities like classification of cards, completion of data tables, creation of bar graphs, and colour stickers to record similarities and differences, 35% of them implemented activities of construction of board game, experiments, measurements and finally, 16% of them suggested activities related to problem solving.

Generally, teachers adopted many of the educational practices implemented in training seminars, such as the construction and use of concept maps, completion of data tables, the use of colour stickers to record similarities and differences, interviews, experiential learning games and construction of board games. This indicates that the design, implementation and impact of training seminars affected teachers, thus they improved their abilities to design their own activities for their pupils. This is very important because every class is different from any other in relation to the pupils' needs, interests and abilities, and teachers have to keep this in mind during planning activities.

Table 5.
Distribution of teaching practices in the new lesson plans

Multiple teaching practices	Number of teachers (N=43)	Percentage
Posters, Artefacts, Painting, Drawing maps, Creation of digital display	30	70%
Filling of text, Vocabulary exercises, Interview, Study of literature, Articles, Formulating arguments, Concept map construction, Formulation of eco-code	23	53%
Songs, Music, Dramatization, Role play, Comics, Advertisement creation, Experiential games, Use of visual artworks	21	49%
Classification of cards, Colour stickers, Filling of data table, Creation of bar graphs	18	42%
Collage, Maquette, Plasticine makings, Construction of board game, Experiment, Measurement	15	35%
Problem Solving	7	16%

Source: Authors' study data

Conclusions and Proposals for Further Research

The one-year training experience with IET who had to pilot the New Geography Curriculum in elementary schools during the 2011-2012 school year, led us to two kinds of conclusions.

Firstly, the findings related to the design of training seminars in NGC in Primary Education seem to be encouraging. The basic design principle of seminars was confirmed, namely that in-service teachers need more practice and less theory. The trainees evaluated positively the experiential character of the seminars, the teamwork, the motto «think, discuss, present», the positive emotional atmosphere, the active participation and the building on the experience of their classrooms, according to the teachers' answers in the questionnaire. Then, it emerged that continuous communication, support and providing of remote guidance could maintain, utilize and extend the educational benefits, as teachers emphasised during the interviews. It is remarkable that in the second year of the pilot (2012-2013), during which no training seminars have been organized and remote communication has been paused, teachers did not create additional lesson plans.

Secondly, the conclusions concern the general principles for successful in-service teacher training. According to our experience, it becomes obvious that the main requirement is the laboratory type of the training seminars, which should focus on group dynamics and on strengthening members' relations, as some teachers of the sample also declared. In addition, according to the teachers' interview data, training should be experiential, should link theory and practice and should be continuous, since the fragmentation of training efforts creates feelings of cancellation and refusal to participate in subsequent training programs. Moreover, the voluntary participation or work permission, in the case of seminars within working hours, are important prerequisites for the success of any teacher training. This is very important in case of travelling in great distances, meaning increase of cost and spending of time, a very usual reason of complain in an insular country like Greece.

Finally, some recommendations for the in-service teacher training in Geography could be the enrichment of teachers' practice with activities fostering the development of spatial thinking, the increase of practicing the triple approach of Geography through interdisciplinarity, further implementation of ICT, creating spreadsheets, concept maps and alternative evaluation methods, according teachers' suggestions during the interview. Topics for further research could be a) the effect of training seminars for teachers over time, b) the comparison of methodological approaches between teachers attended seminars and those not attended and c) the study of geography competences that students acquired by the experiential way of teaching that trained teachers implemented in their classroom and related to what they had learned in training seminars.

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Appendix A

Questionnaire for the evaluation of training seminars on NGC

1. What is your opinion about the usefulness of the training seminars on NGC? Please explain.

   ☐ High ☐ Moderate ☐ Low ☐ None

2. According to you, what are the positive characteristics of training seminars on NGC?

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   ……

3. According to you, what are the negative characteristics of training seminars on NGC?

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4. To what extent you are familiar with the goals of the new Geography Curriculum? Please explain.

☐ To a great extent ☐ Somewhat ☐ Very little ☐ Not at all

5. What is the correspondence between intended learning outcomes and activities proposed by the NGC? Please explain.

☐ Completely correspond ☐ Mostly ☐ Slightly ☐ Not at all

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6. What is your opinion about the Geography Teacher's Guidebook? Please explain.

☐ Absolutely useful ☐ Partially useful ☐ Iindicative ☐ Unnecessary

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7. Have you created a new lesson plan? If yes, for which grade? On which unit? If not, why not?

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8. Which practices you attended during the training seminars you used in the design of your own lesson plan?

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Appendix B

Teachers' interview questions

1. To what extent you understand and prepare activities aiming the development of students' spatial thinking?

☐ *Not at all* ☐ *A little* ☐ *Enough* ☐ *A lot* ☐ *Extremely*

2. What kind of spatial thinking skills proved to be very difficult for your students?

3. Which one of the nine (9) basic concepts of the NGC has been difficult to be approached by students?
(Rated from 1-5 with 1 the most difficult)

☐ Location

☐ Place

☐ Space

☐ Scale

☐ Region

☐ Interrelations

☐ Environmental Interactions and Sustainable Development

☐ Natural and Human Procedures

☐ Cultural Diversity and Understanding

4. To what extent New Geography Curriculum (NGC) promote interconnections between different grades subject matter and different disciplines (interdisciplinarity)?

☐ *Not at all* ☐ *A little* ☐ *Enough* ☐ *A lot* ☐ *Extremely*

5. To what extent you introduce new technologies (ICT) in Geography activities?

☐ *Not at all* ☐ *A little* ☐ *Enough* ☐ *A lot* ☐ *Extremely*

What were your main findings from their use?

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6. Describe any difficulties you faced during lesson plan design and implementation.

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7. Describe any difficulties you faced during pilot implementation of the NGC in your own school.

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8. Identify how the seminars you attended helped you in the implementation of NGC in your own class and school.

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Biographical statements

Dr. Aikaterini Klonari is Associate Professor in Geography Department at University of the Aegean. Her research interest is on Geographic Education and use of ICT in teaching Geography. She teaches a wide variety of courses in undergraduate and postgraduate students. She continues to conduct research locally and internationally on teaching and learning methodology, Geography Curricula and on GIS in Education.

Dr. Achilleas Mandrikas is a teacher in primary education since 1987. He holds a Master in Science Education (2006) and a PhD in Environmental Science Education (2010). Since 2009 he is a School Advisor in Primary Education. His scientific interests include Environmental Education, Environmental Science Education, Air pollution – Meteorology – Winds, Geography.