

SPATIAL SKILLS DEVELOPMENT IN OUTDOOR EDUCATION: A COMPARISON BETWEEN GRADUATE STUDENTS AT THE UNIVERSITIES OF MÁLAGA (SPAIN) AND LINKÖPING (SWEDEN)

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Abstract

The learning of geospatial skills is essential as a transversal matter in many disciplines and as a fundamental skill in lifelong learning. Outdoor Learning offers a perfect scenario to teach such skills in a more active and efficient way. This paper presents the development of these issues with a group of postgraduate students from the University of Málaga (Spain) and Linköping (Sweden) by a set of activities specially created for such a goal. After some introductory classroom and field-trip sessions, practical activities were carried out in order to encourage the use of new technologies in geolocation in connection with historical heritage awareness. At the end of the experience it was conducted an analysis of results from questionnaires with the participant groups. The content of these questionnaires deals with important educational issues such as the opinion of students or the skills acquisition after the experience.

Keywords: *Outdoor Learning, Spatial skills, Field trip, ICT, Geolocation.*

1. INTRODUCTION

This paper deals with the development of an educational action carried out in Linköping (Sweden) and Málaga (Spain) where the use of new technologies, spatial geolocation, heritage awareness and outdoor activities are joined together to contribute to the improvement of spatial and digital skills by the students. Levels of satisfaction and learning perceived by the participants were evaluated by using a questionnaire.

Our purpose is to encourage Outdoor Education in a formal education environment, and with students from any educational stage or subject, beyond the area of Geography.

2. BACKGROUND

Outdoor Education is a very recent line of work and research, but it has a large number of supporters worldwide, it is strongly rooted in countries such as United States, Canada, Australia, New Zealand or Southeast Asia (Nicol, 2002; Lugg, 2007; Ross, Higgins and Nicol, 2007; Ho, 2014).

However, up to 1980 Outdoor Education was given little scholarly attention. Since then, experiences and movements allowing its consolidation as a methodology for learning have increased. The following cases can be highlighted: United Kingdom (Outward Bound movement), Scandinavia (“friluftsliv” or open air), Germany (“Erlebnispädagogik” or experiential pedagogy) and more recently in North America and Australia (Higgins y Kirk: 2006; Beames, Higgins and Nicol, 2011; Gray and Martin: 2012). At all events, many studies have proved the actual increase in Outdoor Education, because it improves the relation between students and environment, resulting in positive effects in their education (Ross, Higgins and Nicol, 2007; Waite, 2007, 2010, 2011; Schmidinger, Molin and Brandt, 2014).

2.1 Literature review

Outdoor Education has a strong pedagogic component benefited from different disciplines such as Geography, Environmental Sciences, History or Physical Education, among others. In spite of being a new academic approach, Dahlgren and Szczepanski (2007, 11-22) indicate the importance of its inclusion in the learning processes, recognised by philosophers, scientists and education theorists of all time (Plato, Aristotle, Parmenides, Democritus, Socrates, Zeno, Seneca, Descartes, Spinoza, Locke, Hume, Kant, Schelling, Hegel, Darwin,...). They highlight, particularly, the works of authors such as Comenius, Rousseau, Basedow, Pestalozzi, Fröbel, Ellen Key, Piaget, Dewey and Molander, among others, who praise the direct use of the environment and experiential learning, as fundamental methods for education. Moreover, more recent studies (Dyment and Potter, 2014) advocate for its inclusion in the academic world as a discipline. Outdoor education improves the students’ ability for interpreting and analysing the processes and phenomena of their environment, by combining conceptual, theoretical and experiential knowledge (Dahlgren and Szczepanski, 2007, 23). In that way, the landscape becomes a basic setting to apprehend and learn the relations between environment and society, which shape all its elements. It is a multi-sensory experience, where what you have learnt settles in your mind for a longer time, because, as stated by Dahlgren and Szczepanski (2007, 51), “a combination of feelings, action and thinking characterises the educational perspective of a highly pragmatic action-focused outdoor education”.

Outdoor Education can be conducted in various settings, through different activities and to reach diverse purposes, by nature-based experiences pursuing a sustainable life (Davis, Rea and Waite, 2006; Clarke and Mcphie, 2014; Nicol, 2014), museum-based learning experiences, (Holmes, 2011), by promoting team working in higher education (Cooley, Burns and Cumming; 2015) and fieldwork at school to know the neighbourhood (Beames and Ross; 2010), establishing urban routes to improve the perception of students of secondary schools in areas at risk of social exclusion (Delgado, Campoy and Subires, 2015), the use of digital technology as a learning tool (Zimmerman and Land; 2014; Lai et al., 2013; Lombrinos and Asiklari; 2014; Esteves and Rochas: 2015), or encouraging sport activities (Gatzemann, Schweizer and Hummel, 2008). The wide range of experiences, ways of application and types of students indicates the high academic interest that this emerging discipline arises worldwide.

3. METHODOLOGY

3.1 Educational context of the experience

The action was carried out in the context of two official Master's programmes offered by Linköping University (Sweden), "MSSc in Outdoor Environmental Education and Outdoor Life", and the University of Málaga (Spain), "Master's Degree in Teaching Compulsory Secondary Education, Post-Compulsory Secondary Education, Vocational Training and Languages", respectively.

The first one consisting of 60 ECTS credits, has two versions, one in Swedish and the other in English for foreign students mainly, it aims at how outdoor studies can enhance learning and contribute to healthy habits, sustainable development and active citizenship (LiU, 2015a). It is organised by the National Centre for Outdoor Education, a subunit of the Department of Culture and Communication at Linköping University.

The programme focused on experiential learning based on nature, culture and society. Teaching includes outdoor field-related experiences in cultural and natural landscapes, and how society, natural and cultural landscapes can be used as resources for learning and understanding our physical environment.

Main skills acquired by the students in the programme (LiU, 2015a) related to their knowledge and promotion of activities outside the classroom to further develop a better understanding of the environment and more responsibility for health, citizenship and sustainability, by using landscape and environmental and cultural experiences as resources for learning.

The programme comprises four modules (LiU, 2015b): Theory of Outdoor Education, Methods of Inquiry and Theories of Research, Outdoor Education and Outdoor Didactics, and Thesis.

The second one is a Master' programme comprising 60 ECTS credits, multidisciplinary and focused on training and qualifying graduates from different university degrees for work as teachers in Secondary Education, Vocational Training and Languages (UMA, 2016a). This Master' programme is organised by the Faculty of Education at the University of Málaga.

The programme focuses on pedagogic and didactic training for those education stages, by providing an appropriate cultural, personal, ethical and social background for the teaching practice, promoting collaboration with other school professionals and the use of classroom-based research processes, and favouring understanding the relations between learning models, school context and the didactic options for the teaching practice (UMA, 2016b).

The program comprises four modules (UMA, 2016b): Generic, Specific, Practicum and free choice credits.

3.2 Activities carried out to develop geo-spatial skills

3.2.1 The seminar "Developing geolocation skills in outdoor activities"

Within both Master's programmes, we held a nine-hour theoretical/practical seminar, over 2 consecutive days at Linköping University (Table 1), and 5½ hours over 4 non-consecutive days at University of Málaga (Table 2).

Table 1. Seminar Schedule at Linköping University

Time	Location/Methodology	Content
Day 1		
30 minutes	Computer room/Instructor presentation	Module presentation. Introduction to geolocation skills
1 hour	Campus Valla LiU/Outdoor practical activity	Breaking the ice: Geolocation activity at LiU Campus Valla
1 hour	Computer room/Instructor presentation	Project OUTDOOR ICT (Objectives, methodology, outcomes)
2 hours	Computer room/Teamwork	Design of activities to promote geolocation skills at Linköping Old Town
Day 2		
3 hours	Linköping Old Town/Outdoor practical activity	Geolocation activities carried out at Linköping Old Town
1 hour 30 minutes	Computer room/Discussion	Final session: Seminar assessment and conclusions

Table 2. Seminar Schedule at the University of Málaga

Time	Location/Methodology	Content
Day 1		
30 minutes	Computer room/Instructor presentation	Module presentation. Introduction to geolocation skills
1 hour	Campus Teatinos UMA/Outdoor practical activity	Breaking the ice: Geolocation activity Campus Teatinos UMA
30 minutes	Computer room/Teamwork	Design of activities to promote geolocation skills at Málaga Old Town
Day 2		
1 hour 30 minutes	Computer room/Teamwork	Design of activities to promote geolocation skills at Málaga Old Town
Day 3		
1 hour 30 minutes	Málaga Old Town/Outdoor practical activity	Geolocation activities carried out at Málaga Old Town
Day 4		
30 minutes	Computer room/Discussion	Final session: Seminar assessment and conclusions

In Linköping, the seminar was held with all the participants in the English version of the programme, coming from different countries. The group included 13 students from Greece, China, Austria, Finland, Germany, Island, United Kingdom and India. All were females but one male participant coming from Greece, most of them with previous degrees in Pedagogy and/or Teaching (except an Engineer).

In Málaga, on the other hand, there were two groups with 41 students each one (Groups C and J), most of them with Spanish nationality and quite balanced in respect to their sex (43 men and 39 women), All of them with a previous degree in History, Art History, Geography or Philosophy.

This seminar presented three fundamental aspects:

1. To encourage digital skills in general (particularly those related to geolocation,
2. To promote active learning methodologies linked to outdoor activities,
3. To develop activities to improve heritage awareness about our natural, historical and cultural environment.

Those were key aspects in the results of the project OUTDOOR ICT (ref. 2011-1-HU1-GRU06-03650-2), funded within the Lifelong Learning Programme of the European Union (Delgado, 2013).

Building on this context, we carried out a learning experience in the area of the development of geolocation skills by using common handheld GPS devices (mobile phones or tablets) with free software (Commander Lite, Google Maps, Google Street View o Google Goggles). The seminar was held at Campus Valla LiU and Campus Teatinos UMA, as well as at the Old Town of Linköping and Málaga.

Our theoretical/practical seminar, “Developing geolocation skills in outdoor activities”, perfectly fitted in both Masters’ programmes, for both content and methodology (alternate sessions in the classroom and outdoors). The main difference was that in Linköping it was carried out during two consecutive days as a block, while in Málaga it had to be adapted to the timetable of other subjects and activities, so it took more days.

To meet the goals of the seminar, a dynamic was created where participants could increase their interest in Geography (as they mostly were students of Pedagogy, Teacher Education, History or Art History), and improve the learning of different skills useful for their professional practice: use of digital devices, geolocation, spatial orienteering, appreciation of the heritage richness of their local area, encouragement of a healthy lifestyle, among other things. All those abilities are included in the general objectives of both Master’s programmes. Therefore, we decided to choose an activity that drew together all these aspects. Orienteering and Geocaching offered multiple possibilities to reach those goals, because they are activities that integrate mental and physical exercise and command of technology (applications, websites, mobile phones, GPS devices, etc.), where age is not a limiting factor, as it can be adapted to all ages and levels (Tejedor Lorenzo, 2006).

3.2.2 Breaking the ice: a route through at Campus Valla LiU and Teatinos at UMA

One of the first activities, carried out in the seminar to break the ice and start from the beginning with an active outdoor methodology, was to prepare a route through Campus Valla at Linköping University and Teatinos at UMA, where participants had to reach progressively 6 different stops, as well as to pass 2 visual tests by answering ten questions related to visual elements near the stops.

They were provided with an instruction sheet with the cues to get to the different stops and the questions to be answered at every stop (Figure 1).

To get to the stops, students had to carry out three types of activities related to geospatial skills:

- Orienteering Test. The location of the place to be reached was indicated by a red dot on a map of the area, participants should use the map to orientate themselves and establish the best route to get to the place.
- Test with Compass. They were given the next place coordinates (latitude and longitude) and they typed them in a GPS device or some app (e.g., Commander Compass Lite), which indicated with a compass the direction and distance to the stop to be reached.
- Test with online maps. They were given the next place coordinates (latitude and longitude) and they typed them in Google Maps, which established the route on

foot to be followed on the map of the area. In this case, they only had to follow the route marked by the software.


Compass test: Open the compass app / GPS and write the following coordinates for reaching the next stop: 58.401709, 15.580712 (58°24'06.2"N 15°34'50.6"E)

STOP 4

We have arrived in the _____ located in the southeastern corner of _____ building

Visual Test

1) How much does it cost to park here? _____



2) Where is the following icon located? _____

Orienteering Test: Go to the red point 2 in the map

STOP 5

We have arrived in the entrance of a building. What building is it? _____

Visual Test

1) How many steps should you climb to reach the main door? _____

2) What shouldn't you do in front of the building? _____

Route in Google Maps test: Open Google Maps and write the following coordinates for reaching the next stop: 58.396142, 15.578313 (58°23'46.1"N 15°34'41.9"E)

We have arrived in the entrance of a building. What building is it? _____

Figure 1. Fragment of the instruction sheet for the route at Campus Valla, LiU.

By alternating the types of tests, we promote the use of different materials and resources, so helping to understand different contents and to encourage the acquisition of several geospatial skills (Table 3), distinguishing between complex and simple spatial orientation. Their difference is that, in complex orientation, students must know how to interpret a map, to position themselves, to locate the starting and finishing points of a route, and to establish the best itinerary, knowing the different elements (buildings, streets, squares, parks, etc.) present on the map, while in simple orientation, they must only know how to follow a route established by a digital device, either by a compass or by a line marked on a digital map. The level required for the orientation skill is different in both cases.

Table 3. Main didactic aspects of the geolocation tests on the routes at the University campuses in Linköping and Málaga

Materials	Concepts that should be known	Skills that can be achieved
Orientation Test		
Physical map	Cardinal points Scale	Complex spatial orientation Map interpretation
Test with Compass		
Digital compass (GPS device or app for cellphone/tablet)	Longitude, Latitude Cardinal Points Basic Essentials of Compass	Simple spatial orientation Compass use Basic digital skills
Test with online maps		
Digital map (GPS device or app for cellphone/tablet)	Longitude, Latitude Cardinal Points Scale	Simple spatial orientation Map interpretation Basic digital skills

The activity as a whole draws on the philosophy of Geocaching, activity whose aim is to hide objects in the countryside or in a town, to note down their coordinates and make them public so that other users can seek them with a GPS location device. The hidden object usually is a container, of different sizes, depending on the point, with some message, a guestbook or even gifts, and where the user may opt for taking one on the condition that another one is left in its place. In our case, for logistic reasons, caches were replaced with visual tests encouraging students' observation, intuition and critical reasoning.

It is worth noting that before the field trip, it would be right to hold a session in the classroom to introduce the students to the different devices and computer applications to be used. It must also be highlighted the importance of creativity when establishing the stops and their tests. For example, in one of the stops a spiral staircase was used for two reasons: to promote healthy habits and less sedentary lifestyles (walking up stairs instead of taking the lift) and to learn in a basic but vivid way, how the landscape offers at ground level a very different perspective that from a bird's eye view. So, they should discover from above which geographic element they could spy. It was a compass drawn on the ground a few metres away from the stairs and made up of tiles. Many were surprised for having passed so many times and not noticing the compass until then. The interpretation of aerial photography, and lately, remote sensing have therefore become common techniques in Geography.

The route at Campus Valla (LiU) was 3.2 km long and its duration was 74 minutes (Figure 2). The route at Campus Teatinos (UMA) was 2.7 km long and lasted 62 minutes.



Figure 2. Route taken at Campus Valla LiU and an image of the southernmost point

3.2.3 Team working: Thematic routes at Linköping and Málaga old towns'

After taking the route at the University campus, the following activity was proposed to the participants: they should make, building on the experience carried out in the morning, a route at old town, but taking into account the following aspects:

- The route should have three stops and two tests (mainly visual) at every stop.
- Their length should be 45 minutes at the most.
- They could use three types of tests according to their tastes and availability of materials, by using all the three types, two of them or only one.
- Moreover, what is most important and distinct from the morning route: They should create a thematic route, i.e. the three stops should have some kind of connection among them to give meaning to the route as a whole.

The class was divided into groups and each one worked on its route with support from the instructor. The intention of adding the thematic aspect was that instead of finding a cache, a physical object, as they usually do in geocaching activities, the “cache” would be the place itself, by establishing in every stop two tests. Thus, it was encouraged at the same time the development of geographical skills of vital importance such as orientation, map interpretation (map of the town) and observation of the environment, together with digital skills by using geolocation software (Google Maps and Google Street View) in common devices such as smartphones or tablets. We also used Google Goggles, a computer application that allows identifying, with images from our own device, objects or landmarks, by providing information about them. It is worth noting that users themselves uploaded the database of images and information related to the different places in a collaborative and selfless way, which it is a significant example of what we know as a web 2.0 or social web. Learning those applications may be useful for the acquisition of digital skills (To process and upload images and texts, search information, etc.) and the awareness about heritage and environment (highlighting landmarks or places of special natural and/or cultural importance).

Being an activity focused on the significance of places added an element of awareness of their cultural or heritage value, enhanced by using Google Goggles, if wanted. Moreover, since a team conducted the activity, it also encouraged collaborative work and social skills.

In the following session, the students took the three routes. At Linköping University, although it was somewhat strenuous because they took them one after another, covering some 6.7 km in 2 hours 45 minutes, the result was highly satisfying:

- In general, the three routes complied quite well with their allotted time. Only one of them took more time because a fourth stop was added, which could not be reached but it would have given the route a special component.
- All the groups focused their routes on locate their points through digital maps (Google Maps). That is a widely used application that they are very familiar with, which favoured their choice. Orientation tests were not established (maybe because they wanted to use the digital component), nor were those with compass (maybe because of the need of using a more specific software).
- Regarding the thematic aspect of the routes it must be emphasised a very high motivation for their elaboration and originality, as they were interesting and even entertaining.

Those routes were:

- 1) A walk through Central Park in Linköping (Trädgårdsförening), visiting different places of interest such as the Tropical House, the Belvedere Tower or the Nature Centre. This group used Google Goggles, although they did not find with it any of those monuments,
 - 2) Swedish typical food, visiting different shops such as a bakery, a fishmonger’s shop and a supermarket, emphasising their typical products and their anecdotes.
 - 3) Sweetshops, visiting three of the most popular in the city, and highlighting some curious anecdotes. A fourth stop, curious but necessary, completed the route: Consultation at the local dentist’s office.
- Creativity in the tests must also be highlighted. As well as visual tests, the groups included questions where they should do some physical activity or ask people working at the established places about particular aspects.

At the University of Málaga, carrying out the different prepared itineraries was somehow more complex, as there were many groups and they could not take the routes at the same time. Moreover, not all the groups prepared itineraries, although they did participate in the practical session at the city centre. Besides, the time devoted to the activity at the city centre was an hour and a half against three hours taken in Linköping. Due to all the above, and for practical reasons, they took jointly an only route, so that after finishing it, each group had the opportunity of taking one or two more routes by their own in a specified time. Afterwards, all the groups met at a place to finish together with the activity. The outcome was also satisfactory:

- The routes adjusted quite well to the strictly geographic area of Málaga old town. Only a route had some more distant points, so that they could not be finished.
- Most itineraries, alternated test for locating points on a map and orienteering tests based on previously given geographic coordinates by using Google Maps. Only a group chose to use exclusively points on a map. None of the groups used orientation with compass, maybe for the need of using specific software they were less familiar with.
- In respect to the thematic nature of the routes it is worth noting the high motivation for their preparation and originality, all of them were interesting and even curious. Some of the routes chosen were:
 - 1) “To discover Málaga among books and paintings: archives and museums”, visiting some of the most relevant buildings in this line of Málaga old town.
 - 2) “Route of historic bars in Málaga”, visiting three of the oldest bodegas in the city.
 - 3) “Explore the different historical periods in Málaga”, taking a walk through the main landmarks from the contemporary age to the Phoenician age.
 - 4) “Archaeology of Roman Málaga”, giving some additional information so that participants answered some questions about locating elements of the Roman town.
 - 5) “From museum to museum and the Game of the Goose”, locating some of the most important museums in the city.
 - 6) “Civil War in Málaga”, a very original route and even quite unknown, visiting some landmarks (e.g. the place where political prisoners were held) from this event of the recent Spanish history.
 - 7) “Routes of Málaga Sculptures” highlighting these significant elements of the street furniture.
- It is worth noting the creativity of the tests. Besides visual tests, the groups included issues such as asking questions or doing some physical activity, although by the content of most routes it is clear the background of the participants, most of them came from History and Art History.

4. ANALYSIS

Once the activity had finished, in both Linköping and Málaga, a survey was conducted among the students to know their opinion about the activity carried out, the abilities acquired in it and how useful was what they had learnt from their daily life and their academic and/or

professional performance. The questionnaire includes open-ended and close-ended questions; and a Likert scale was used as an assessment tool.

Having results from the same activity in two different spaces, although in similar contexts –two postgraduate master’s programmes for training teachers of social sciences- allow us drawing conclusions from the relevance, interest and adequacy of the activity to the student’s profiles, and also making comparisons between both experiences.

In Linköping, ten out of thirteen students (76.92 %) participating in the seminar answered the survey, while in Málaga, where there were 82 students matriculated in the course (divided into two groups), answered 37 of them (42.05 %). Although the percentage of participation in the survey in Málaga was lower, the results obtained from the 47 answered questionnaires are significant enough to make a comparative analysis of both experiences, and to draw some initial descriptive conclusions applicable to the participating groups and some evidence about the usefulness of training Social Sciences’ teachers in the development of geospatial skills for outdoor education.

In respect to the profiles of the students participating in the survey, while in Linköping predominate the female sex, nine out of ten answers were women (90%), in Málaga the number of men was higher than that of women (56.76 % against 43.24).

In Linköping, their ages ranged from 22 to 26 years, and the Degree obtained before taking the MSc in Outdoor Environmental Education and Outdoor Life was related to the field of Education (Pedagogy, Primary Education, Physical Education, Chinese as a Foreign Language), except an Engineering graduate. As it was a Master’s programme with an international focus, imparted in English, The students had taken their degrees in seven different countries, 5 in Europe (Austria, Finland, Greece, Island and the United Kingdom) and 2 in Asia (China and India).

In Málaga, the range of age was much wider, from 22 to 58 years, although most students were in a bracket from 22 to 27 years old. The average age, however, was 28 years, because there were six people over 30 years –three of them over 50–. As their speciality was Social Sciences (Geography and History, and Philosophy) within the “Master’s Degree in Teaching Compulsory Secondary Education, Post-Compulsory Secondary Education, Vocational Training and Languages”, the students came exclusively from that field of study. Participants with a Bachelor’s Degree in History (64.87%) dominated over students with a Degree in Art History (21.62%), Geography (10.8%) and Philosophy (2.7%).

Let us start with the analysis of the results. When consulting students about the interest, relevance and utility of what they had learnt from their everyday life and professional practice, in Linköping (Figure 3) there is a majority of those rating these aspects with 4 or 5 (agree and absolutely agree). Thus, 90 percent of those surveyed agree or absolutely agree that what they had learnt was relevant, interesting and useful for their everyday life, and 80 percent for their professional life.

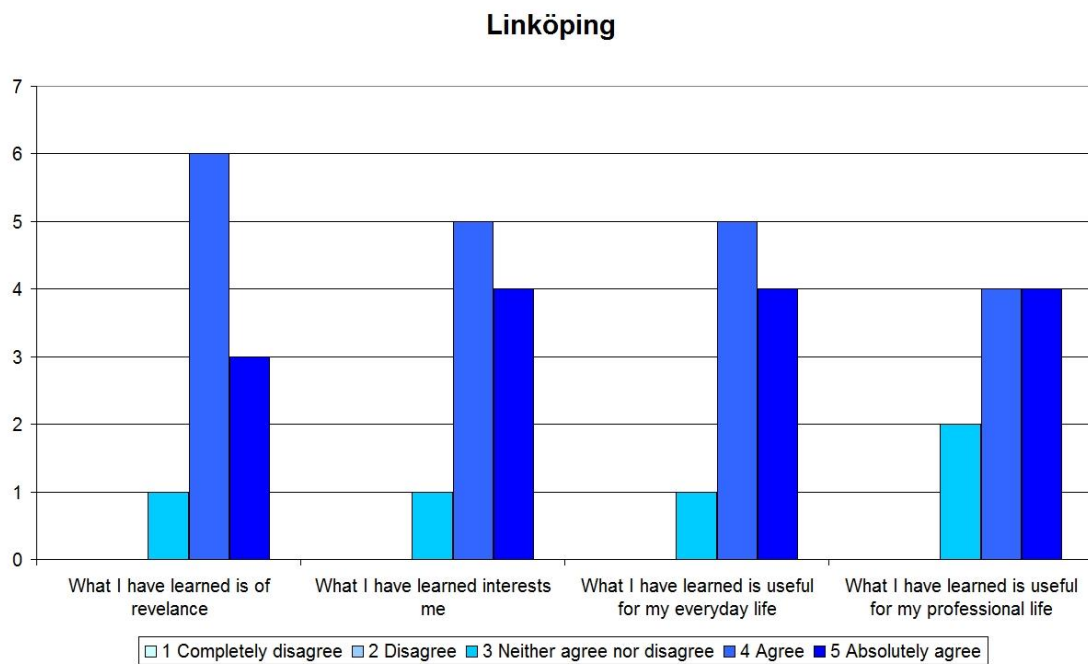


Figure 3. Opinion about the relevance, interest and utility of what they had learnt

In Málaga (Figure 4), there also was a prevalence of positive opinions. However, some differences with Linköping can be observed. Thus, to the question about the utility for everyday life, although the number of positive opinions (4 and 5) was higher, the most repeated option was 3 (neither agree nor disagree). In proportion, two thirds (67.57%) of the surveyed agree or absolutely agree with what they had learnt was relevant, for three quarters (75.67%) it was interesting and useful for their professional practice, and for a proportion slightly below a half (48.65%) it was useful for their everyday life.

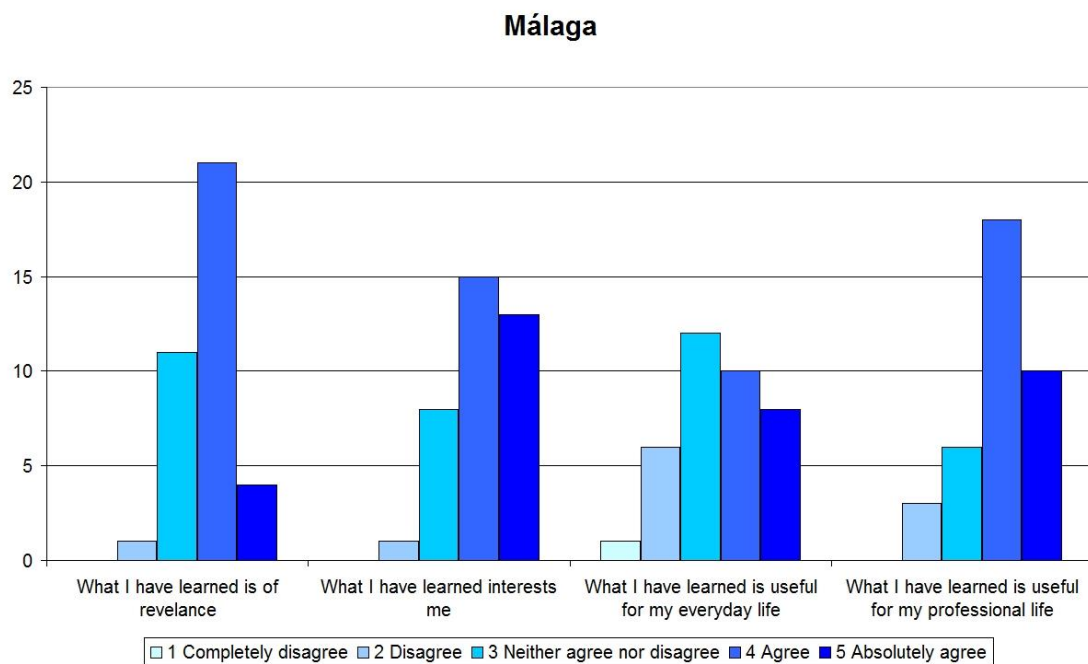


Figure 4. Opinion about the relevance, interest and utility of what they had learnt

By comparing the average rates obtained in Linköping and Málaga (Figure 5) respectively, we observed that points in Málaga were lower than those in Linköping, particularly, for the question about utility for everyday life. To look for a possible explanation for that we should consider the profiles of the students targeted for this training programme, although in both cases it was training for teaching Social Sciences. Thus, while in Linköping they were students of a Master’s programme focused on outdoor education, in Málaga the programme was intended for secondary school teachers. The preconceived idea they had about their future teaching practice was different (the former in the open air, the latter in traditional classrooms), and this seems to influence their own perception of the relevance, interest and utility of what they had learnt. There was little difference in the case of utility for professional life, but highly evident in the case of utility for everyday life. Although there are no available data about the high or low level of sedentary lifestyle and physical activity of the participants, it can be observed differences in their lifestyle habits.

In the light of the results, students from the master’s course in Linköping seem to be more inclined than those from Málaga to carry out outdoor activities requiring geospatial abilities – not only in a professional way, but also in a personal way, in their leisure time, or in their everyday life, and in their interaction with the environment- and to consider the course to be more useful. Moreover, in Linköping, students came from different countries of world, and since they are people that had learnt to manage themselves outside their own environment, the development of this kind of abilities was basic for them.

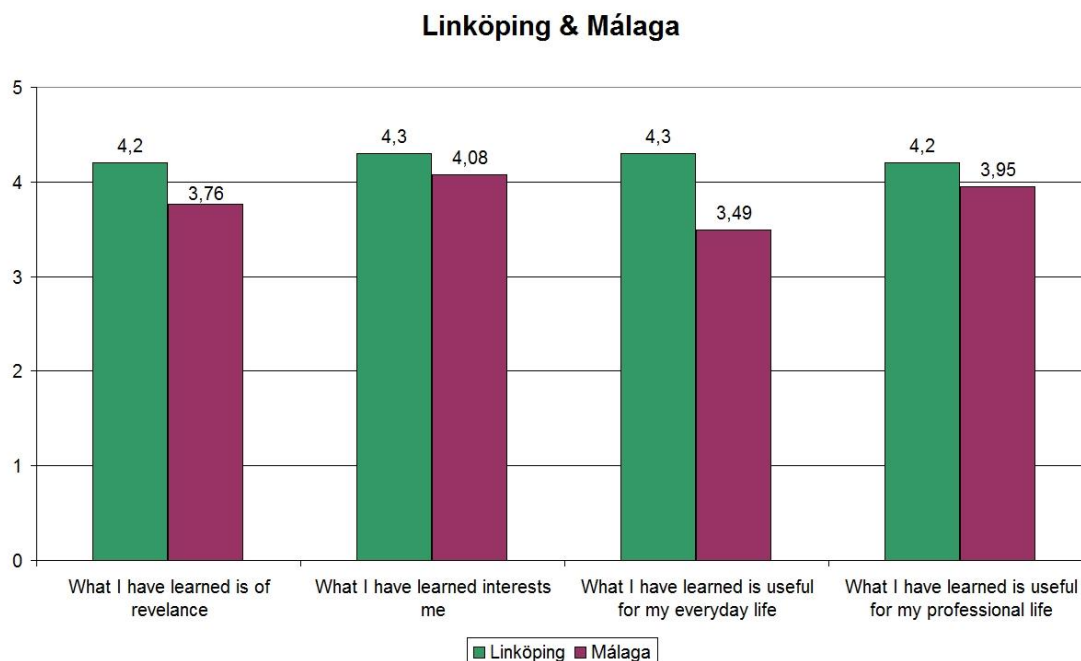


Figure 5. Opinion about the relevance, interest and utility of what they had learnt

The level of satisfaction in Linköping (Figure 6) with the methodology used, the atmosphere in the classroom, the support received and the way that classes were given, was very high. There were 90% of positive opinions for methodology and 100% on the three other questions presented. There was no negative opinion and it is worth noting the high level of satisfaction with the way classes were given, rated with a 5 by all the students that responded to that question.

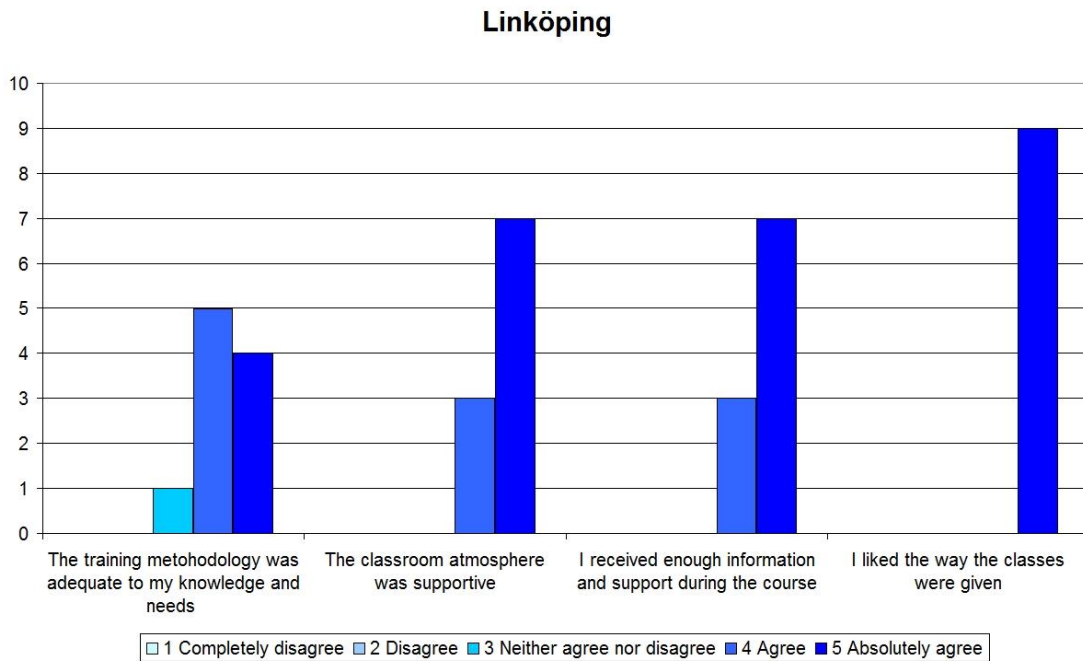


Figure 6. Methodology, support in the classroom and level of satisfaction with the teaching

In Málaga (Figure 7), it can also be noticed a high level of satisfaction with all the questions presented, with no negative opinion. 78.38 percent agree or absolutely agree with the methodology used, 94.59 with the statement that the atmosphere in the classroom was supportive, 89.19 percent with the information and support given during the course and 81.08% with the way the classes were given.

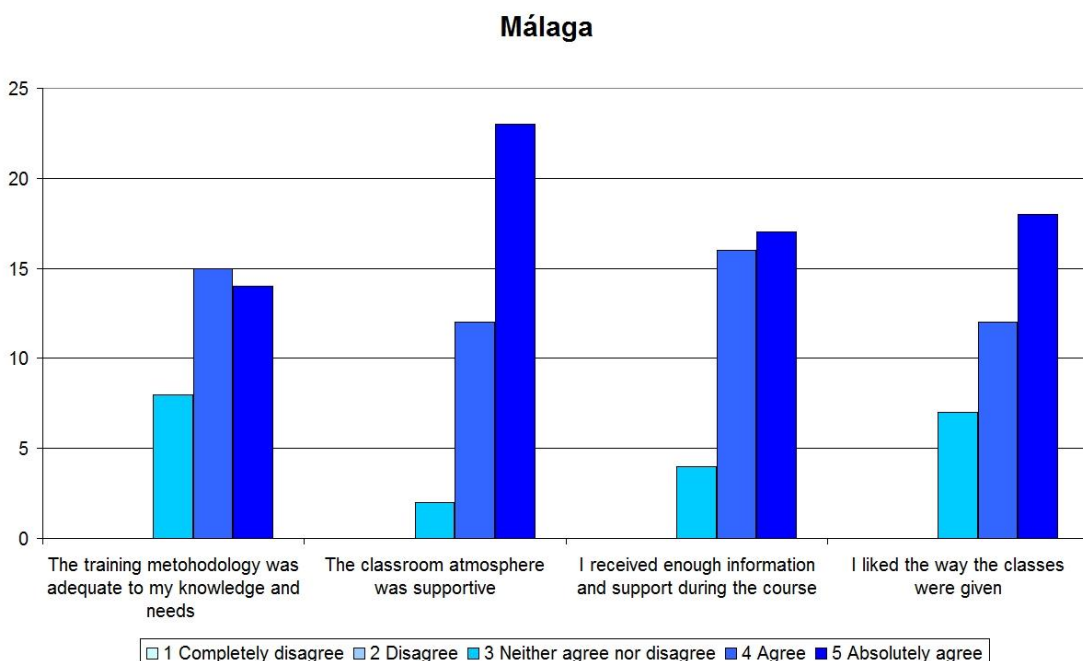


Figure 7. Methodology, support in the classroom and level of satisfaction with the teaching

Although in this case, the level of satisfaction was very high in Linköping and Málaga (Figure 8), a little difference can be observed and the values from Linköping are again, for all the items, slightly higher than those from Málaga.

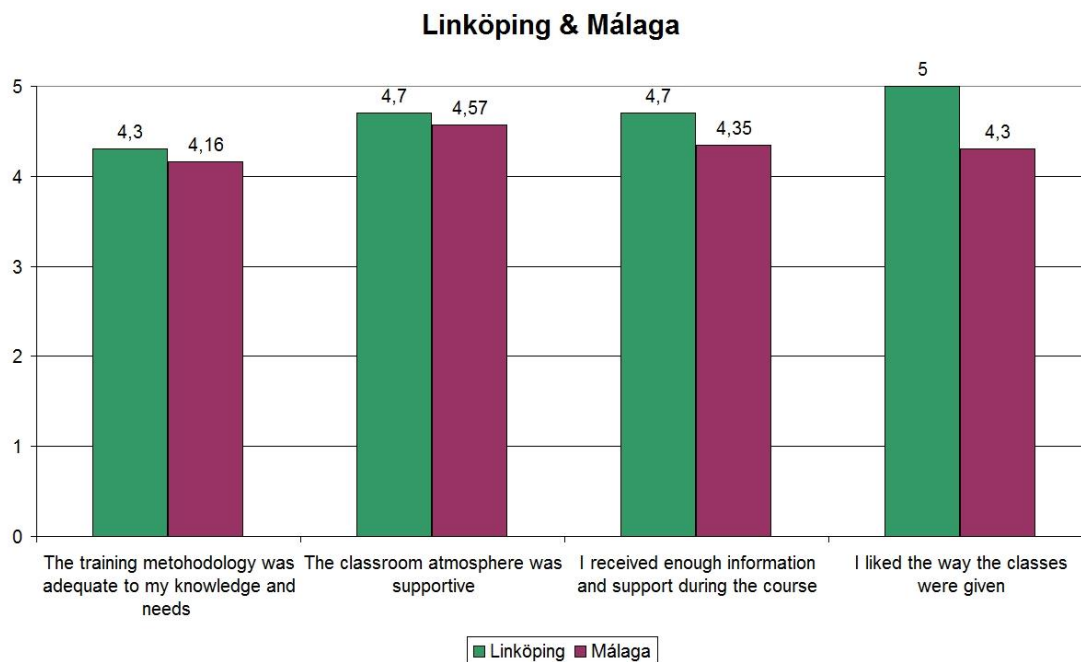


Figure 8. Methodology, support in the classroom and level of satisfaction with the teaching

Students’ participation and their level of motivation were other key issues for assessing the activity. In Linköping (Figure 9) all the students surveyed –except a person that neither agrees nor disagrees- consider that they actively participate in the development of the classes. As for levels of motivation, the highest increase was for outdoor activities -90 percent of positive responses- and team working -100 percent-. The level of high motivation when using tools was 80 percent.

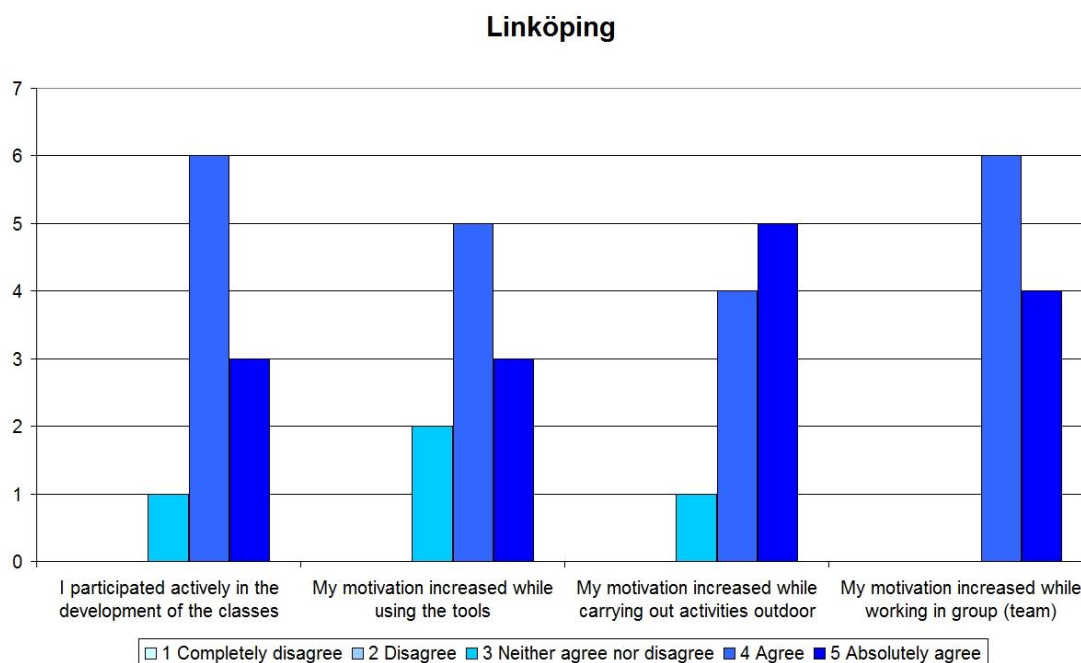


Figure 9. Participation and level of motivation

In Málaga (Figure 10), 81.08 percent of the students answering the survey considered that they actively participated in the development of the classes and most responses were 5. In

respect to the levels of motivation, the highest rating was for outdoor activities (89.19 percent) and team working (86.49 percent). The increase in motivation was lower when using tools (67.57 percent of positive responses).

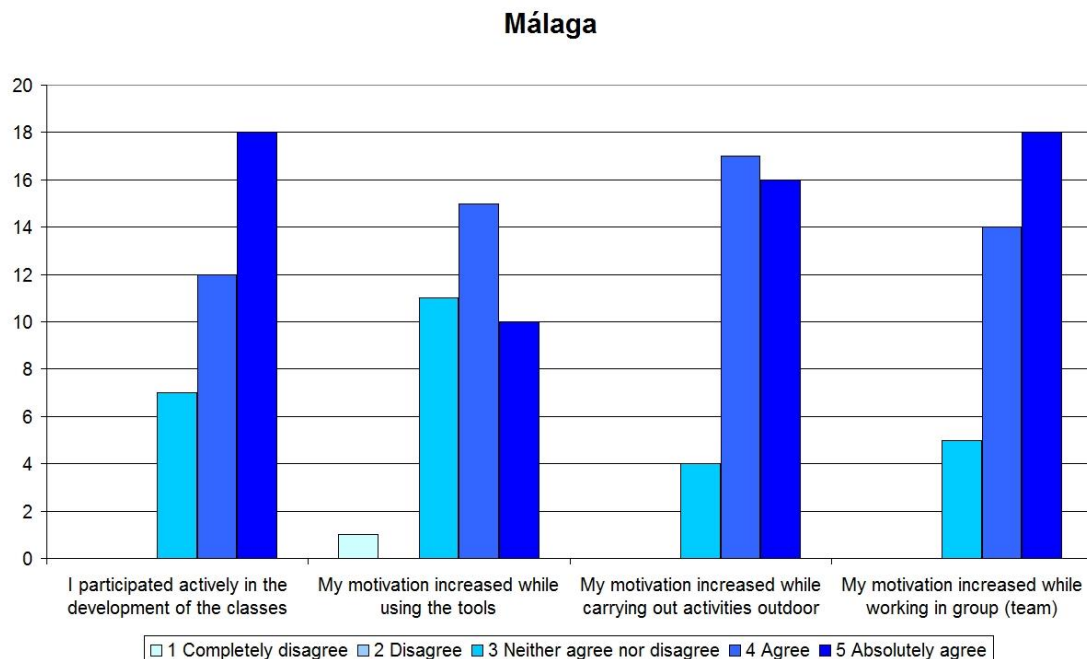


Figure 10. Participation and level of motivation

Calculation of average ratings (Figure 11) allowed us to notice that there was a strong similarity between Linköping and Málaga. In addition, it can be observed that students from Málaga gave a higher rating for their active participation in class than those from Linköping. In respect to the levels of motivation, in both cases, the increase of motivation is higher when they carry out outdoor activities and when they work in groups, and slightly lower when using tools.

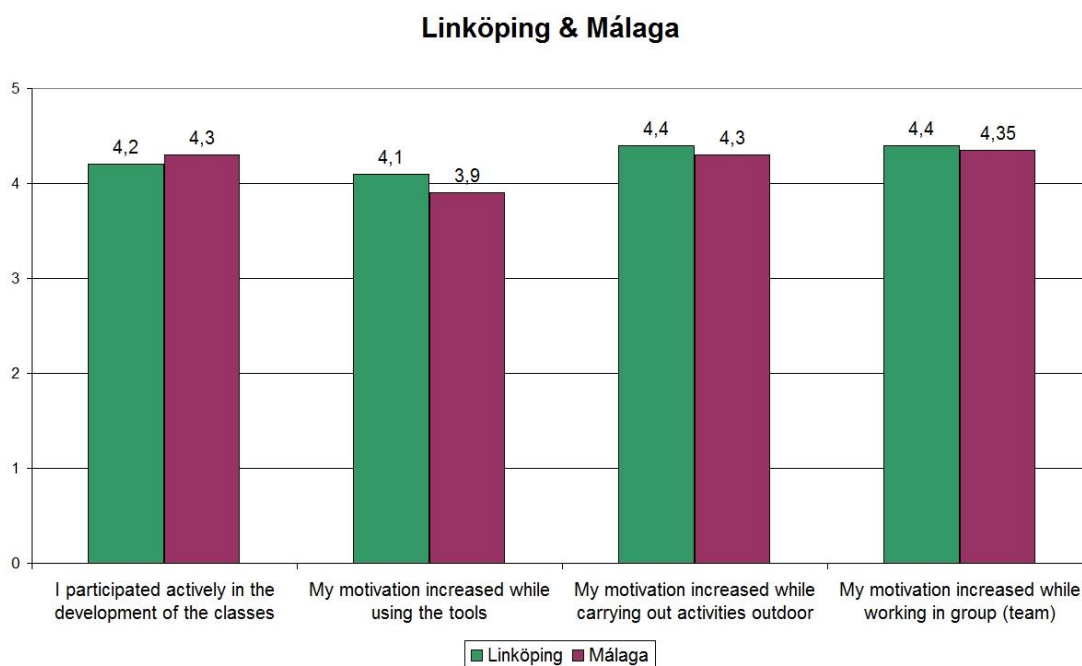


Figure 11. Participation and level of motivation

In Linköping (Figure 12), all the students participating in the survey indicated that the seminar met their expectations.

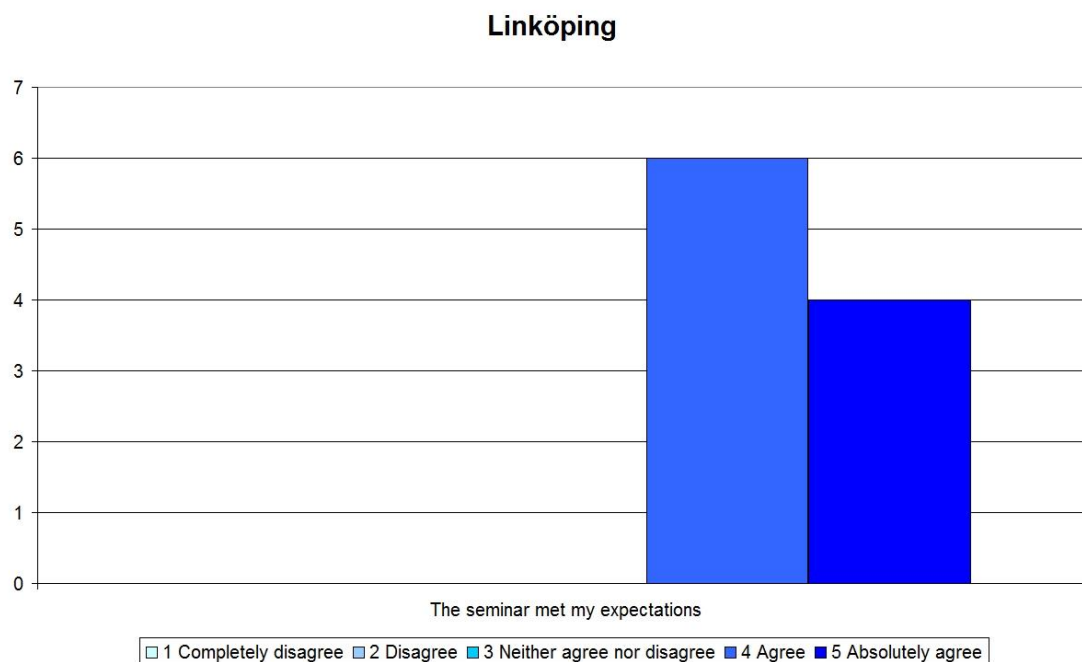


Figure 12. Fulfilment of the expectations

In Málaga (Figure 13), the students for whom the activity met their expectations were a majority of (86.49 percent). There also were 10.81 percent who neither agree nor disagree, and 2.7 percent (one student) who rated negatively the fulfilment of his expectations, with 2.

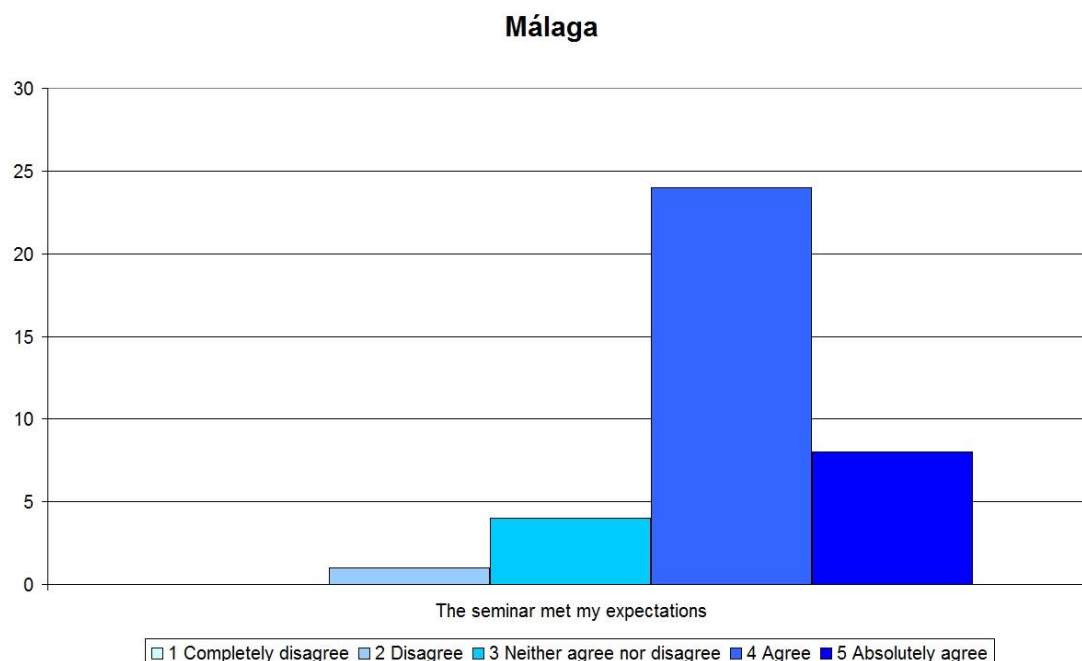


Figure 13. Fulfilment of the expectations

When comparing the average rating from Linköping and Málaga (Figure 14) it can be noticed that the level of fulfilment of the expectations in Linköping is higher than that in Málaga. Therefore, we go back to the idea that students from the master’s programme

imparted in Sweden have, due to the subjects of that postgraduate programme, more inclination to carry out outdoor activities than those from Málaga, and this has an influence when assessing the activity as a whole.

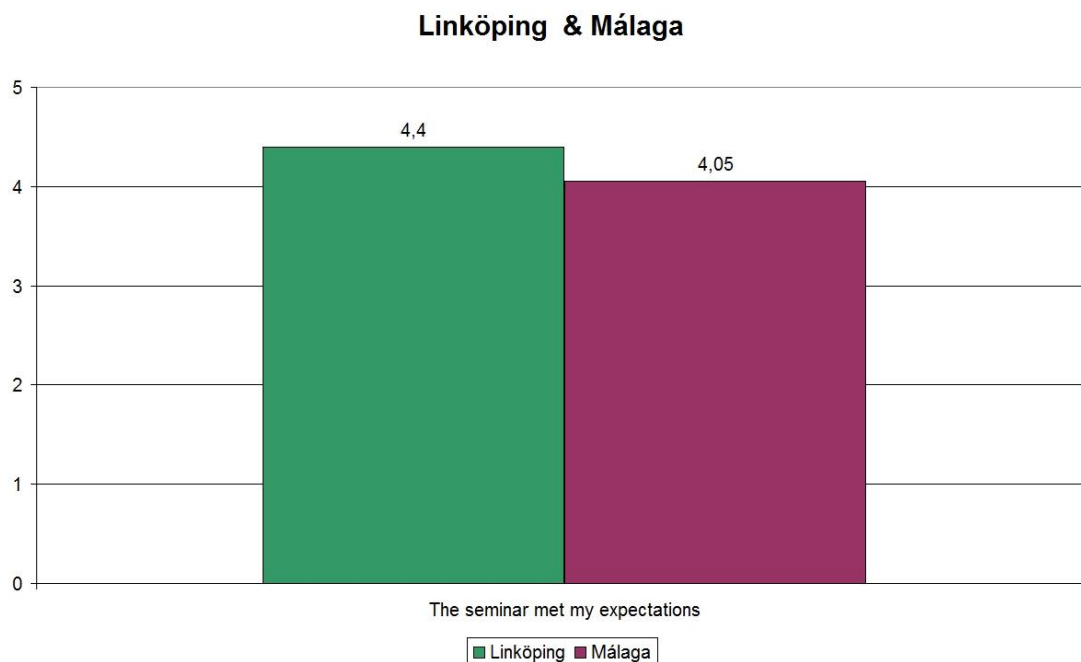


Figure 14. Fulfilment of the expectations

In the section of the survey where students should explain why they rated negatively some of the aspects previously evaluated, in the case of Linköping there was no negative response. In Málaga, they answered the need for more time to carry out the activity or not to be motivated, for coming from a field of knowledge different from Geography and not having previous knowledge. On the contrary, those having previous knowledge about the subject expected a higher level of depth.

There were students, in both Linköping and Málaga that took advantage of this space for setting out not negative reasons for their ratings, but positive.

“We take part in the activity or study. It’s fun and more effective to study when work in a group or study outdoors using the new tools appeals to me a lot” (Linköping, 2015)

“I have evaluated negatively no aspect because I consider that this part of the subject has been developed in an interesting way, I have learnt a lot and above all, the tools used can be useful for the classes” (Málaga, 2016)

Besides the assessment of the activity as a whole, it was important to know the students’ opinion of the different sections into which it was divided. In Linköping (Figure 15), the activity with more ratings of 5 was the outdoor trip to the city centre, followed by the session of work in groups. As for percentages, 80 percent of students assessed positively the presentation of the activity and the outdoor exercise “breaking the ice”; 90 percent, the work in groups and outdoor exercises; and a hundred percent the debate and conclusions.

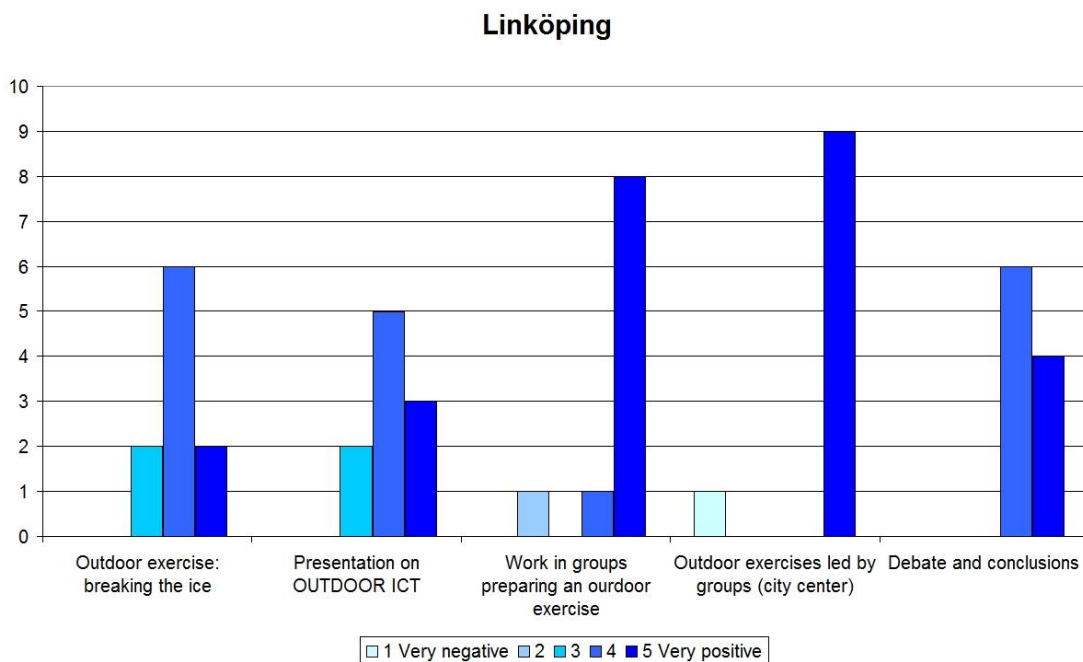


Figure 15. Assessment of the seminar’s activities

In Málaga (Figure 16), the activity with more ratings of 5 was also the outdoor exercise to the city centre. 89.19 percent of the students rated positively the two outdoor sessions at both the Campus and the city centre; 81.08 percent the work in groups preparing the exercise; 75.67 percent, the presentation of the activity; 64.86 percent, the debate and conclusions. In this last case, the reason for lower ratings may be that, due to the few hours of lessons and the high number of participants on the itineraries, a session of debate and conclusions could not be held with sufficient time and depth.

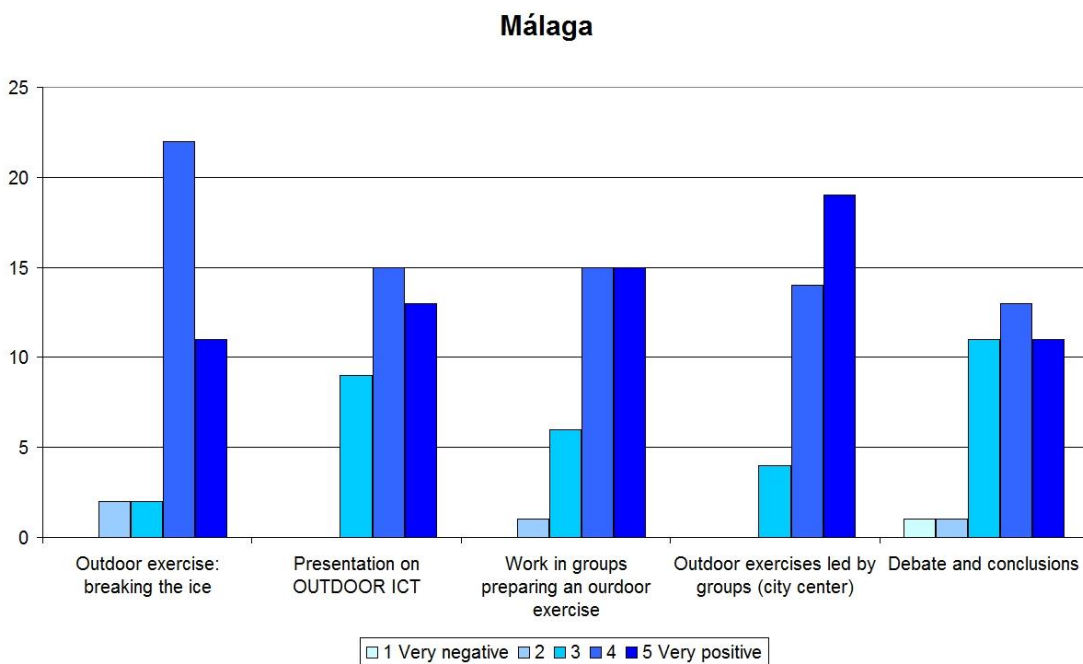


Figure 16. Assessment of the seminar’s activities

In both Linköping and Málaga (Figure 17), students were more interested in practical activities. The two highest rated activities were the outdoor group tests at the old town and team working for preparing those tests. Both breaking-the-ice starting session and the presentation of the activity had similar ratings of the students from both universities, whereas it can be observed marked differences in the discussion and conclusions, better valued in Linköping than in Málaga, as stated above.

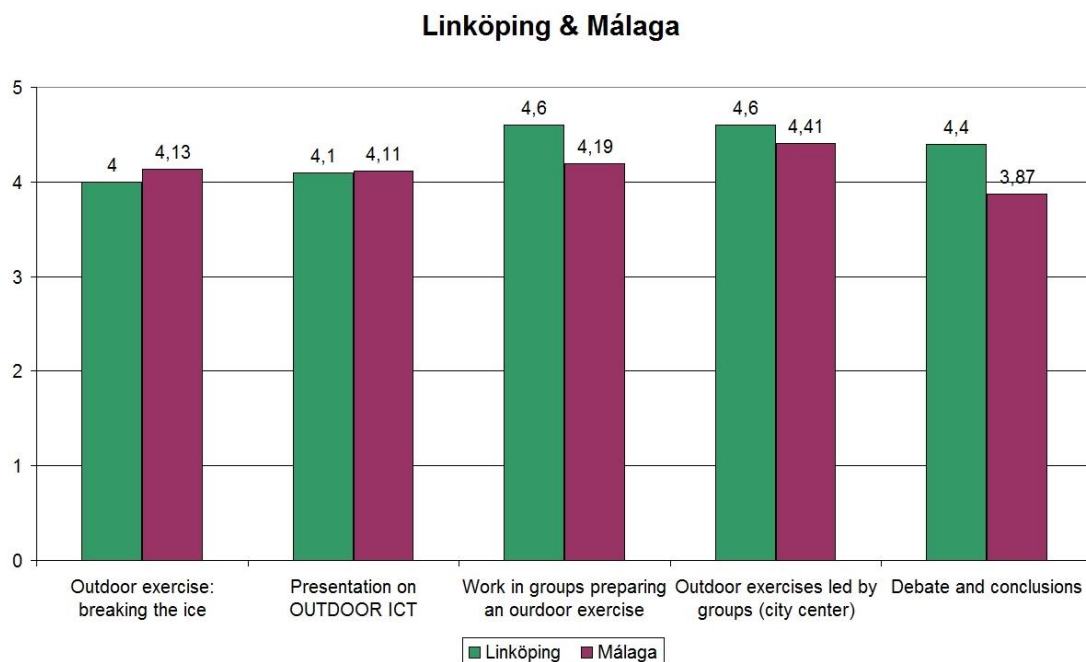


Figure 17. Assessment of the seminar’s activities

Another key issue was to know the level of previous knowledge of the students on the use of GPS, compass applications and Google Maps. In this way, we would be able to check to what extent the activity had contributed to the acquisition of skills by the students when using those tools. We should not forget that they are digital natives, very accustomed to the use of technology.

By calculating the average from the answers of all the students participating in the survey, we obtained the following results:

The perception about the level of knowledge on the use of GPS before and after carrying out the activity is quite similar for the students from Linköping and those from Málaga (Figure 18). Before the activity, the average was 6.2 and 6.51, respectively, while afterwards it increased up to 7.9 in Linköping and 7.76 in Málaga.

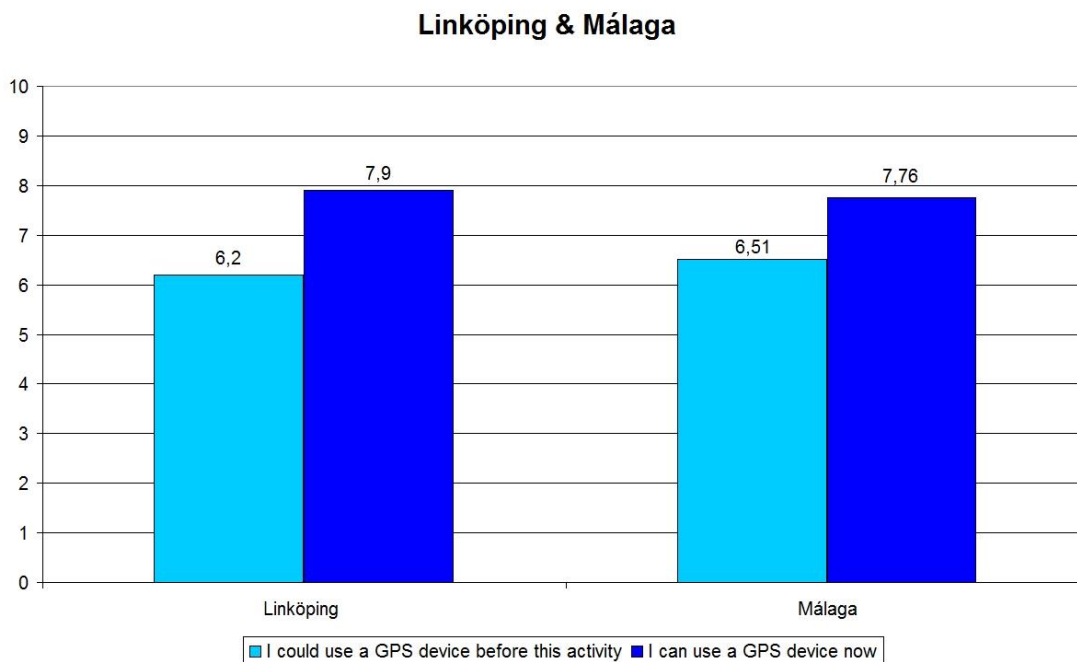


Figure 18. Level of knowledge about the use of GPS before and after the seminar

In respect to the compass, the average on the level of previous knowledge was in both places below 5 (Figure 19). Málaga students, who started from a lower level, had a more significant increase in their perception of the use of the tool. In Linköping, the difference between before and after the activity was 1.8 points while in Málaga it raised 3.46.

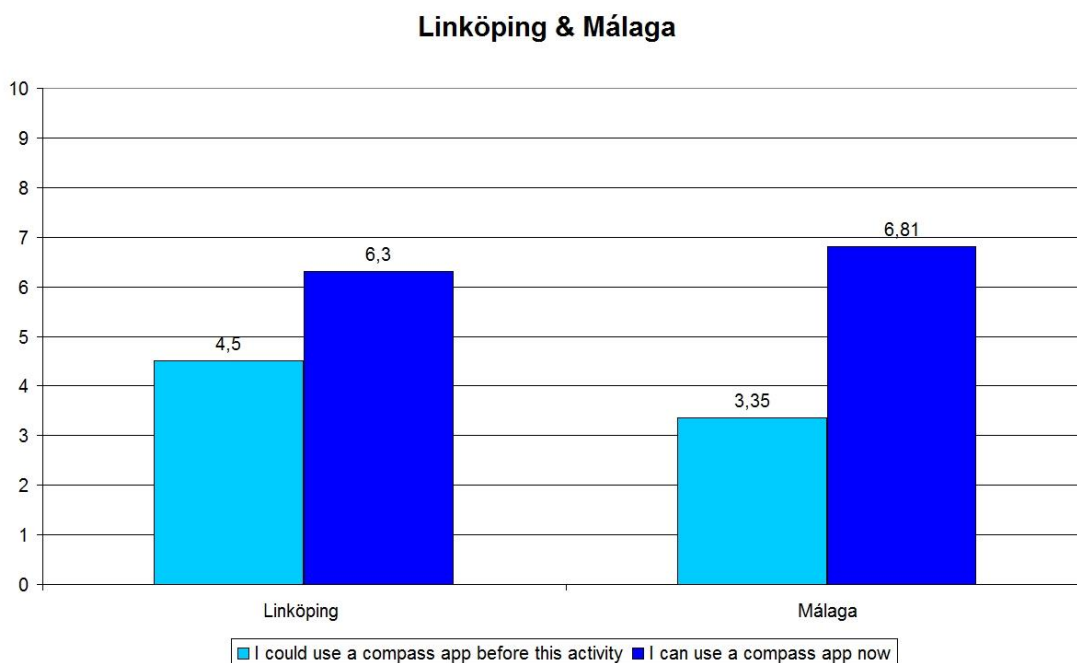


Figure 19. Level of knowledge about the use of compass apps before and after the seminar

As for Google Maps (Figure 20), the level of use of the tool was quite high for all the students before participating in the activity. In both Linköping and Málaga, it was around 8 and raised up to 9.3 after finishing it.

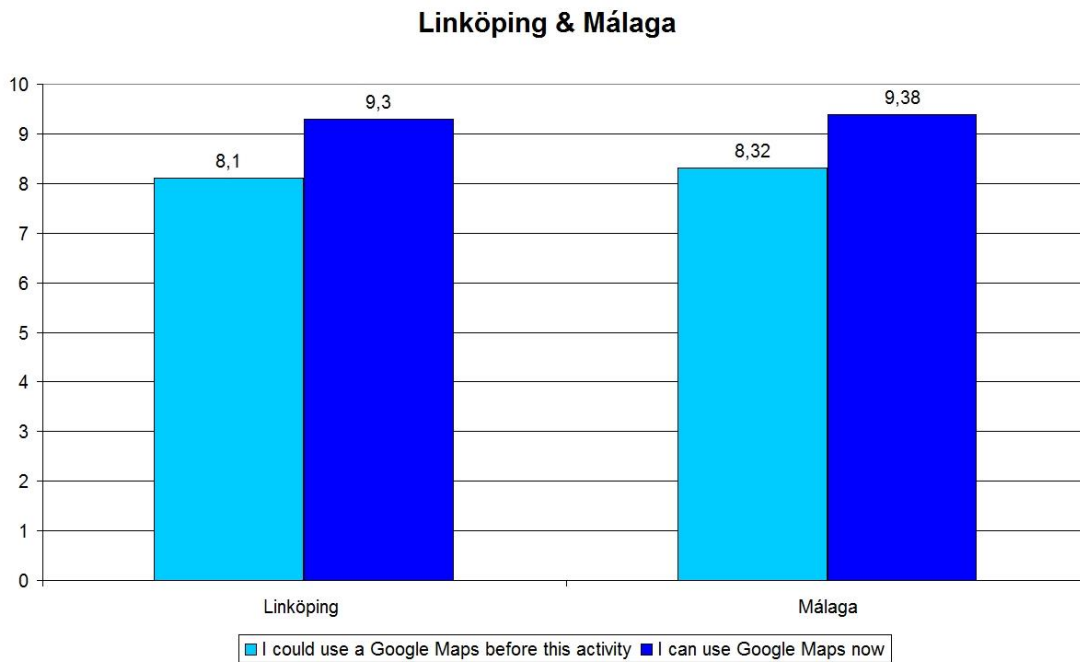


Figure 20. Level of knowledge about the use of Google Maps before and after the seminar

When asking the students which of the three methods used –orienteeing, compass or route with Google Maps- they preferred (Figure 21), the most repeated answer, in both Linköping and Málaga, was Google Maps, 40% and 56.76%, respectively. In Linköping, also, 30 percent opted for a combination of orienteeing and Google Maps; and in Málaga, 2.7 per cent opted for the joint use of the three methods. As for the choice of orientation exclusively with a map of points, the percentages are quite similar among the students of both Master’s, 30 per cent in Linköping and 24.32 in Málaga. There certainly was a significant difference in respect to the compass, as in Málaga was chosen by 13.51 percent of the students, while in Linköping, nobody chose that option. Finally, in Málaga, 2.7 percent preferred not to choose any of the three methods.

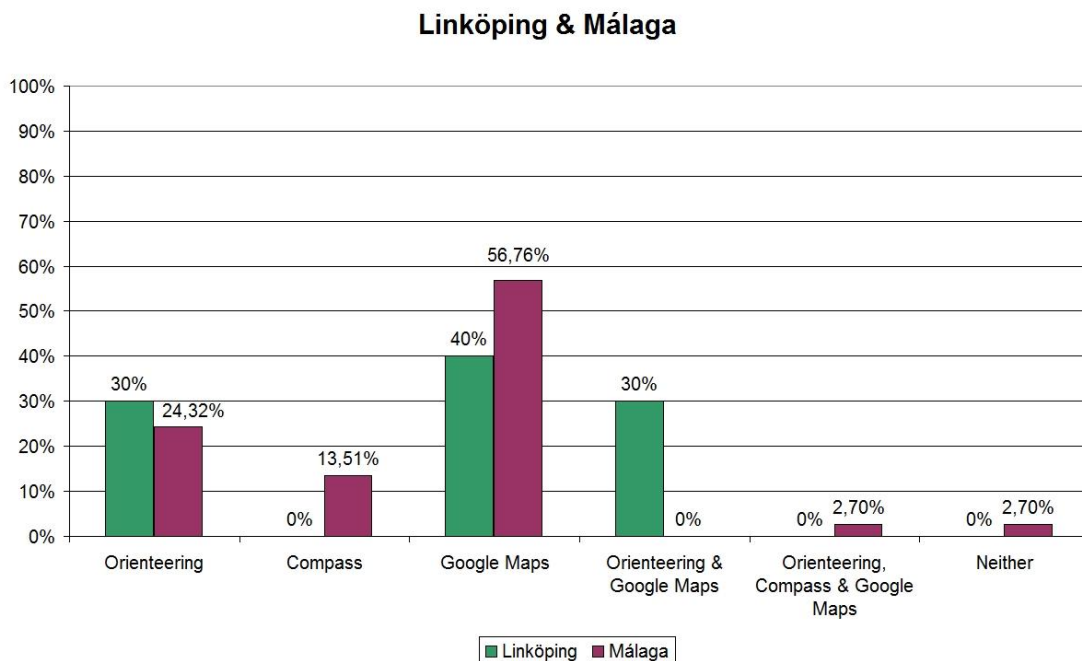


Figure 21. Favourite of the three methods used

The reasons mentioned by those who chose Google Maps included that it is a tool used in our daily life, that they are familiar with, because they used it frequently, and they also considered that it is quicker, simpler and handier: “because it’s an application that I use several times per day and has a lot of great aspects” (Linköping, 2015); “because it is a tool that, unlike others, is already in our everyday life” (Málaga, 2016); “because is very easy in handling, is very clear about the directions and I am more used to it” (Linköping, 2015); “because it is a handy and quick tool, it also help you to make better planning” (Málaga, 2016).

Some students highlighted that it was more visual and allowed them better orientation: “it is more visual and realistic, so it makes easy the spatial positioning” (Málaga, 2016); “because we can see the route. As well as the direction. It makes me clear about where I am and where I’m going to” (Linköping, 2015).

One of the best-valued aspects of the tool was its practical usefulness and the possibilities it offered: “I can use it for my everyday life” (Linköping, 2015); “it has more tools to use” (Málaga, 2016)...

Expansion of mobile phones also helped to Google Maps to become the favourite option for many students, because it allowed combining the different methods, and its application to teaching and to the development of digital skills:

“It is handier to work with on the street, because you do not have to take any thing extra but your mobile phone, besides it allows you to watch it at different scales very easily and above all, you may say that includes the two other options and allows the students to work with ICTs”. (Málaga, 2016)

Those who chose map orienteering did so because it was a challenge for them and they considered that improved their sense of direction and allow them to develop skills that they would not acquire otherwise: “in spite of finding more useful the route with Google Maps, orientation with points seems to me more attractive for the challenge it implies” (Málaga, 2016); “it is a bigger challenge and it develops better orientation” (Málaga, 2016); “because it gives a stronger sense of place though might be sometimes hard” (Linköping, 2015); “it contributes to acquire skills that you would not develop otherwise” (Málaga, 2016); “because it requires higher attention by the students to space and sense of direction” (Málaga, 2016).

One student also highlighted that the activity could be carried out without turning necessarily to technology: “What I liked most was the map with points, as you can follow the activity without depending on mobile devices” (Málaga, 2016).

Students who chose the compass had in common their origin –University of Málaga-, and their degree –Bachelor in History-. The reasons they argued for choosing this tool were similar to those preferring orientation. They highlighted the need for knowing how to use it, the challenge its use implies for them, and how interesting is to use it as a tool: “I had not used it before and for me it is interesting and beneficial” (Málaga, 2016); “the use of the compass seems to me very interesting because its use is a challenge for me, it is the most difficult tool for me to use” (Málaga, 2016).

Besides consulting the students at what extent, they considered what they had learnt to be useful for their professional life; they were requested to include some practical example of how they could put it into practice in their academic and professional. The most common response, in both Linköping and Málaga, was to use it in their own teaching, by conducting practical activities. Let us remember that the goal of both Master’s degrees is to train teachers, and the intention of these students is to develop themselves as professionals in this field.

In Linköping, “[...] to teach students the use of compass or Google maps to find the way or their positions”; “create games and outdoor activities to teach to the students useful everyday objects”; “Conducting real time activities on GPS for children”... were some of the proposals made by the students of the course. They highlighted also that... “increase use of technology in school”, or allowed working with ICTs in a “cross-curricular” way”. Several students focused their proposals on childhood education, although others extended them to secondary and university education.

In Málaga, where the Master’s is oriented at training teachers of secondary education, most students considered conducting this kind of orientation activities in their future classes of Geography, History and Art History:

“It could be interesting for secondary and high school students to conduct an orientation itinerary in groups, as we have done in class, and to link it to a historical, archaeological or museum-based subject, in both urban and rural areas” (Málaga, 2016)

“I would like to be able to take with my students an itinerary through Málaga old town, so that they watched in the morning several monuments in chronological order, for them to learn about the place they live in, and to acquire skills such as awareness for the cultural and historic heritage” (Málaga, 2016).

Some students indicate the playful nature of the activity, the use of alternative to traditional methods, and even the possibility of using these resources within the space of Education Centre itself and the field trips: “To take advantage of some outing from the school to include this method and make the trip funnier and more entertaining”. One student highlighted its application to students from any education stage: “in general, this kind of activities is good for any professional working with children, teenagers or even adults”. Two students highlighted also that they would apply what they had learnt on their own Master’s practice. Other uses proposed by students from Málaga, were for indicating their own position, carrying out thematic routes or creating virtual visits.

When asking the students about what they had liked most of the activities carried out, in Linköping they highlighted preparation and taking the route through the city: “The last practical activity in the city centre. We had the opportunity to practice the three methods taught as well as having fun and getting to know the city at the same time ”.

Students also valued particularly the learning acquired, the new opportunities open for their work as educators, the class atmosphere and the working methodology itself: “I really enjoy that kind of activity in which we can discover useful information by ourselves as well as the way we worked, i.e. on groups”; “The methods were useful both in everyday life and professional life. The atmosphere of the seminar was very warm and open for questions and talk”.

In Málaga, there are four elements repeated in the comments made by the students surveyed: breaking out of their routine, outdoor teamwork, motivation and recreation.

The idea of breaking the routine appeared in several responses, linked to other aspects such as team work, motivation, entertainment or practical application: “the most entertaining has been to take the route as a team and break the routine of just staying in class explaining how it is with no practice”; “it is a way of breaking the dynamic of taking classes within the classroom, and increasing in this way the students’ motivation”.

The fact that they were outdoor group activities, and the increase in motivation entailed is another aspect most valued by the students: “to be able to work in groups and in the open air”; “companionship, change in group dynamics, because we had always been in class

during the whole Master's, and how collaborative it was"; "to work in the open air was an extra motivation for the students, besides it improves the sense of direction"...

Another key idea was to learn in an entertaining way: "by playing a game we have learnt to learn. Getting away from rote and traditional learning. Thank you!"

In addition, the activity adapted easily to any subject, what made it be more entertaining and motivating. For example, one student highlighted "the wide range of subjects to which this methodology can be adapted and also how entertaining it was". Another important aspect is to put into practice what they had learnt in the classroom, "to be able to make your own itinerary, because you put into practice what you have learnt", allowing the students "to become aware of the utility of this kind of activities".

One student highlighted the development of digital skills, another one valued to know other options from the tools they usually use for other purposes. Moreover, taking the activity allowed them to know better the city of Málaga. All of this entailed a key idea: To be aware of the place as a learning space. As one student highlighted "to be aware of what the entire city offered me to take it to a classroom".

Finally, for the question about what they would change in the activity, a student proposed "more input on which app's" and how to work with coordinates, others, to learn more about teacher's methodology or make more competitive the outdoor activity, introducing some new element, such as, for example, a prize with a time limit. On the hand, one student indicated that she "would change nothing".

In the case of Málaga, a third of the students participating in the survey indicated the need of having more time to carry out the activity, especially for the last session of debate and conclusions: "To have had more time in the sessions for taking as a whole all the itineraries presented by all the work groups from the class" (Málaga, 2016)

As an alternative, one student suggested, "to reduce the number of itineraries at the centre for being able to take them thoroughly and with more time", and another one, to change the duration of the activity in relation to the itineraries through the city.

Other students suggested increasing the level of difficulty of the activity and making longer itineraries, or that the groups should be smaller. Some also suggested, as in Linköping, make the activity competitive: "I would look for a way to making them more participative by carrying out some kind of contest among the groups". Finally, several students stated that they would change nothing.

5. CONCLUSIONS

The results obtained in Linköping and Málaga were highly satisfying. As the survey shows, the activity was useful for the student to increase their level of knowledge about orienteering and using GPS devices, compass and Google Maps, by developing their geographical and digital abilities. In addition, it allowed proving that students were interested in applying what they had learnt to their future professional practice, by using active methodologies, which encourage critical thinking, team working and learning to learn, as well as improving social abilities. Outdoor activities, outside the classroom, and their practical implementation in real contexts were highly valued by the students of both Master's programmes, as demonstrated by the high level of motivation and creativity when carrying out the activities and the result of the survey.

Comparatively, we can observe a difference between students from Linköping and Málaga when carrying out outdoor activities, whereas for the former it was their natural environment, for the latter it was "alternative" to the traditional, which it was a classroom. That is why for the students of the Master's programme in Málaga, the idea of breaking out of their routine was so apparent. Nevertheless, the positive results of the experience carried out at both

universities support the adequacy of outdoor activities within the curriculum of a Master's programme for teachers' training, as well as their relevance to carry them out for all the education levels.

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