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'One just better understands.....when standing out there': Fieldwork as a Learning Methodology in University Education of Danish Geographers

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Abstract

The process of becoming a geographer is by no means simple and incorporates huge amounts of disciplinary embodiment. This paper provides an example of how this is enacted by exploring the perceptions of fieldwork within the education of Danish geographers. Firstly, the history of education of Danish geographers is unfolded. Secondly, it is shown that despite quite different organisational structures, in terms of the way that fieldwork is introduced and the educational structure in general; only little variations in learning objectives can be identified between the three Danish universities that educate geographers. Thirdly, based on an empirical study of Danish university geographers, we find three different perceptions of fieldwork as a learning methodology: fieldwork as an outdoor laboratory, fieldwork as sensuous realisation and fieldwork as a meta-theoretical practice. The results show that these three perceptions are not allocated to different academics or traditions, meaning that the individual researcher often encompasses more than one view of fieldwork either in relation to his or her own research or in relation to the education of future geographers. The categories of fieldwork presented, therefore, do not support the often claimed dichotomy between physical and human geography. Instead, the openness of geography as a synthesis discipline is found.

Keywords: Perceptions of fieldwork, learning methodology, university level, Denmark

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Introduction

In the public imagination geographers tend to be identified with maps, globes, travel plans and fieldwork. The research field of geography is constantly contested both from within the research field itself and from the outside when, for example, new fields of knowledge emerge like climate change (for a UK example see Sidaway & Johnston 2007).

All this has relevance to the education of new geographers. They are entering a field in constant development and are supposed to navigate their own enactment of being a geographer. The process of becoming a geographer is by no means simple and enfolded huge amounts of disciplinary embodiment. Studies have shown that adapting geographical competences is significantly different in different cultural settings, which give emphasis to various elements of geography (Simandan 2002, Nairn 2007). A growing number of papers in this journal (RIGEO) focus on geography education in different countries and cultural settings. Through their analyses of the great variety of geography education we have a rich source of understanding the issues of becoming a geographer, however more implicitly explored (e.g. Resnik Planinc 2011, Giorda & Di Palma 2011, Segeren 2012).

In this paper we aim to contribute to this particular field of knowledge by providing an empirical analysis of the education of geographers in Denmark. This is done by, firstly, providing a retrospective view of the development of geography at university level and its relations to secondary school level. Secondly, we present an empirical analysis of contested ideas of fieldwork given significance by researchers at universities for the education of geographers. The analysis is framed by Zelinsky's three fieldwork categories (Zelinsky 2001). Finally, we discuss the results that have bearing on the education of future geographers and the importance of different cultural settings when studying fieldwork traditions in geography.

The methodological approach of emphasising fieldwork to embrace contemporary geography consists of a duality. Firstly, it suggests the notion of becoming familiar with the field(s) of geography throughout education. Secondly, it suggests the idea of being situated in the field as a learning methodology. By exploring contested ideas of fieldwork, it is hoped to go beyond this being and becoming in geographical education (Gould 1999, Zelinsky 2001).

Human geographers' fieldwork is sometimes cocooned as the art of collecting shared memories in public space, while physical geographers tend to associate fieldwork with objective data collection and their spatial characteristics in the physical environment (Fuller et al. 2006, DeLyser & Karolczyk 2010). Others see fieldwork as the art of bringing together theory and practice. For others again fieldwork represents a methodological approach to bring space into being in theoretical formulations. Certainly, most of us agree that fieldwork is a learning methodology (Scott, Fuller & Gaskin 2006, Hovorka & Wolf 2009). Fieldwork is relevant to many geographers and is by many considered to be among the core 'cultural' training and educational efforts in becoming a geographer (Kent et al. 1997, Fuller et al. 2006, Hope 2009). This brings us to our research questions: How, therefore, is fieldwork taught in contemporary Danish

geography? How is fieldwork represented in curricula? And how do university geography researchers conceive of fieldwork as a learning methodology?

Methodology

The methodological approach to analyse the current teaching of geography is designed to examine, firstly, the history of Danish geography – in particular, to emphasise the human-nature theme, in which fieldwork traditions dominate – secondly, the present educational-politico framework of how fieldwork is given priority in curricula (and their formal requirements); and thirdly, how these requirements are enacted in practice, their status in university geographers' interpretation of fieldwork as an educational tool. For many university geographers' fieldwork has served as a central component not only of their own education but also later in their research and teaching activities. For this reason, we found it valuable to consider the plurality of geographical interpretations by exploring the complexity and multi-dynamical ways in which fieldwork is practised and contested by Danish university geographers (Hope 2009). The concept of fieldwork is indeed dynamic and enriches geographical work in multiple ways and traditions. Often clear geographical imaginations blossom when fieldwork is mentioned. Yet, it is sometimes hard to give a concise and condensed answer of what fieldwork actually is and how we learn to practise it. This is simply because fieldwork is something we do tacitly, implicitly and explicitly (Sæther 2007). The methodological approach, therefore, aims to grasp the duality between becoming familiar with the field(s) of geography and being situated in the field as a learning methodology (Gould 1999).

To address this duality of being and becoming, we analyse the empirical data through an analytic design inspired by Zelinsky's (2001) argument for three general categories of fieldwork. The first is a commercialised form of fieldwork, in which the fieldwork is based on the normative agenda to support the interest of a client. Fieldwork with a reflective rather than a commercial ambition is included in Zelinsky's second category. Here, fieldwork is conducted to solve a research question. Fieldwork may be standardised through new ways that need to be integrated into the existing schema. The last category is fieldwork as an ad hoc, impulsive and informal practice (Zelinsky 2001). In this paper, the fieldwork categories of Zelinsky are used as a framework for analysis since they stress multiplicity in explaining human-nature representations, while leaving room for understanding how such depictions come to embody scientific habitual history-disciplinary traditions. Thus, all empirical interview data and study regulations were categorised and condensed into Zelinsky's framework. In this way, we hope that the analysis has much to say about contested ideas of fieldwork within geography and can unfold how fieldwork encompasses multiple geographical disciplinary approaches. Moreover, emphasis on fieldwork serves as a way of highlighting traditional distinctions between physical and human geography. Thus, recognition of the diversity among human geographers and physical geographers who, for instance, do not work with human-nature relationships, is combined with asking, for example, about human-nature relationships within fieldwork in the contemporary education of geographers. This approach makes it possible to see how fieldwork is conceptualized and how this influence how students become geographically trained and their understanding of

human-nature interactions developed (Hovorka & Wolf 2009, DeLyser & Karolczyk 2010).

Data collection, process and sample

During 2012, interviews were conducted with almost all permanent employed geographers at three Danish universities, the only higher education institutions in the country offering geography programmes. The interviews had a special focus on fieldwork in relation to the education of geographers. All full-time, permanent scientific staff, associate professors and professors teaching geography at Copenhagen, Roskilde and Aalborg universities were interviewed, except researchers who were either on fieldwork themselves, visiting other universities, attending conferences, or authors of this paper. Thus, 31 of 42 university geographers were interviewed – 42 being the total number of permanent researchers of geography involved in the education of geographers in higher education programmes in Denmark. In total, 24 full-time associate professors and professors at Copenhagen University, 15 full-time associate professors and professors at Roskilde University and four full-time associate professors and professors at Aalborg University were interviewed.

The authors of this paper are both insiders and outsiders in relation to former and present colleagues within this group of university geographers. Further, all three authors are insiders in relation to the research matter, because we are all doing research within the field of geography like our interviewees. To address this double insider role, we have followed the recommendations of Adriansen & Madsen (2009). Firstly, we acknowledged that some interviewees were too close to establish an interview/interviewee relationship and, therefore, certain that the author doing the interview was not too close to the interviewee. Secondly, we paid special attention to pursuing ‘you know’ answers. In the interview-situation the responders were all asked similar questions about the role of fieldwork for the education of geographers. What did they understand by fieldwork? And what did they regard as the most important things they learnt through fieldwork? Further, in their opinion, can one become a geographer without being on fieldwork during his or her education? These questions qualify our examination of contested ideas of fieldwork as a learning methodology. To be insiders in relation to one’s research matter means that we have access to and produce valuable research results otherwise not found (within the field of geography, see e.g. Simadan 2002, Madsen & Adriansen 2006, Madsen & Winsløw 2009).

A thematic analysis was used to analyse and structure the empirical data (Braun & Clarke 2006). The thematic analysis was situated in a phenomenological approach, where departure is taken from the individual interviewee’s experiences, and the focus is on the subjective perception of the investigated topic. The research data were produced in line with Zelinsky’s fieldwork categories using meaning condensation as described by Kvale (1996). In this respect, a thematic approach is not inductive as elaborated in Braun & Clarke (2006), but constitutes an interplay between theoretical categories and empirical material. To organise the data material and construct the resulting categories, we posed an analytical question: what are the interviewees’ perception of the role and

relevance of fieldwork in the education of geographers in relation to the outcome for the students, and in relation to the students' process of becoming a geographer?

Interview methods are valuable in the analysis of contested ideas of fieldwork, but were also supplemented by examination of study regulations to explore the formal depictions of fieldwork. Since study regulations can be acknowledged as the 'law' that constitutes the legal and administrative basis, they are considered to be a useful analytical object reflecting the background from which courses, curricula and educational practices develop (Roskilde University 2006, Copenhagen University 2009a, 2009b and Aalborg University 2010a, 2010b, 2011). Thus, in these documents fieldwork, field courses and fieldwork requirements were identified.

Findings

History of geography education in Denmark

The teaching of geography in Danish universities has both in the past and in the present sought academic identity through 'the geographical experiment'; that is, 'an experiment in keeping nature and culture under the one umbrella' (Livingstone 1992:190). Indeed, in 'Jorden og Menneskelivet' (The Earth and the Human Life), the tellingly entitled four-volume handbook that for some decades was core reading for Danish students of geography, the field was (with an underlying measure of environmental determinism) specified in this way:

The task of geography is to depict the Earth as the home and field of activity of human beings. Land and people, nature and culture, are the topics the geographer strives to connect; his [sic!] goal is to demonstrate how human life and culture are conditioned by the Earth's natural conditions and utilise the possibilities afforded by the Earth's nature (Vahl & Hatt 1922: 1; here quoted in translation from Larsen 2009:15).

As one may note, fieldwork is not far from the heart, the methodological study that brings together nature and culture, land and people.

In their emphasis on the physical conditions for economic life, Vahl and Hatt could be said to follow the tradition of Malthé Conrad Bruun (1775–1826), the exiled Dane, who in Paris (as Malte-Brun) authored the renowned *Précis de la Géographie Universelle* (1810–1829) and, in 1821, co-founded the first geographical society, Société de Géographie (Bredal 2011). As we will outline in this section, such focus on the human-nature relationship has been both a cornerstone and a stumbling block in the evolution of Danish university geography, in which the notion and use of fieldwork seems to play its part.

In name, if certainly not always in practice, geography has been a part of the Danish university world since c.1635, when the first professor of geography and history was appointed at Copenhagen University. Until the establishment of Aarhus University, in 1928, Copenhagen housed the only university in Denmark. Yet, the field was for long a more or less neglected appendage to other teaching and research interests, and we have to look to the second half of the nineteenth century for the emergence of geography as a

distinct university discipline (Christiansen, Kingo Jacobsen & Nielsen 1979). As in several other countries, the establishment of Danish university geography was preceded by the 1876 formation of a geographical society: The Royal Danish Geographical Society (RDGS). The establishment of the RDGS was not detached from educational questions. Its object was (and is) thus 'both to further knowledge about the Earth and its inhabitants and to extend the interest in the geographical science' (quoted in Christiansen 2005:7), and one of its architects, Edvard Erslev (1824–1892), was a prominent autodidact geographer, a teacher of school geography and the author of several influential geographical textbooks. Yet, the initiators mainly represented military, commercial and explorative interest (Illeris 1999, Christiansen 2005).

The RDGS played a part in the establishment of Danish university geography, but it was particularly the introduction of geography as an upper secondary school subject – and the resulting need for qualified teachers – that, in 1883, led to the appointment of Ernst Løffler (1835–1911) as reader in geography. Løffler's position, which five years later was transformed into a professorship, was thus directly linked to the 1883 introduction of a graduate-level final examination (*skoleembedseksamen*) in natural history and geography aimed at teaching in the upper secondary school. Shortly before his death, Løffler wrote that it had been the vocation of his life 'to bring geography to our university as an established and fully-entitled subject' (quoted in Buciek 1999:41), and his personal struggle to get an academic foothold was intimately linked with the establishment of geography at Copenhagen University. Much like Halford Mackinder argued that it 'is the duty of the geographer to build a bridge across the abyss', between the natural sciences and the study of humanity, '[l]op off either limb of geography and you maim it in its noblest part' (Mackinder 1887:145), Løffler found that 'neither nature nor the human life can be excluded without in that way maiming geography as a science' (quoted in Christiansen, Kingo Jacobsen & Nielsen 1979:393). Also, for Løffler, a 'holistic' approach to human-nature relationships was a key to the academic identity of geography. He emphasised the human side, however, and was not pleased by the discipline's drift towards the natural sciences in the last decade of his life (Buciek 1999). It should in this respect be kept in mind that the introduction of geography had been met with scepticism at the Faculty of Science, which questioned the need of geography, as 'all the component parts of the field are already present'; this opposition was particularly overcome by the new need for geography teachers (Christiansen 2005:13). The education of teachers for the upper secondary school came in many ways to mark the development of Danish geography education for the next hundred years. In the words of Martin Vahl (1869–1946), professor of (physical) geography (1921–1940): 'the vast majority of those who study geography at Copenhagen University intend to become teachers in the upper secondary school' (Vahl 1924:122). In fact, looking back on the early history of geography at Copenhagen University, three geography professors found that 'scientific geography has paid dearly for sacrificing so much of its strength on the altar of the school' (Christiansen, Kingo Jacobsen & Nielsen 1979:391).

To qualify graduates for the upper secondary school was also the primary reason for establishing Danish geography education at Aarhus University. More specifically, the aim was also to qualify history graduates to teach geography. For this reason, and in

contrast to the situation at Copenhagen University, the chair in geography was situated at the Faculty of Arts. This was undoubtedly the reason for the Copenhagen professors' emphasis on physical geography!

Today, Aarhus University no longer offers a Master's Degree in Geography, and many related disciplines at the university have substituted much of what geographers previously regarded to be core geographical themes. In contemporary Danish universities, a Geography Master's Degree is offered at Aalborg, Copenhagen and Roskilde. The three institutions, however, have quite different educational structures and organizational traditions, which make them interesting subjects for analysis. The diversity in teaching geography is still set to be inherited by the history-geographical battlefields described above of which human-environment relationships continue to provide dynamism, enthusiasm and lively discussion. Intended learning outcome is always influenced by political configurations. Fieldwork by no means counteracts, but remains a gathering point for human and physical geography to assemble as 'curricula constructs' and to determine how fieldwork is taught (Illeris 2012).

Present education of Danish geographers and fieldwork affiliations

In the Danish school system geography is taught as an independent subject from lower secondary school (7–9 class) and in upper secondary school (1–3 G)⁴; it is mandatory in the first year and optional in the following two years. In primary school, geography is taught in 1–6 as 'Natur og teknik' (Nature and Technology) together with physics, chemistry and biology.

The education of teachers in Denmark is split in two: one for primary teachers that takes place at University Colleges (CVU), and one for secondary teachers and university teachers that takes place at the universities. Besides the keen relationship between geography at university and in upper secondary school, which is demonstrated in the history of geography education, contemporary geography is also characterised by strong relations between the geography curriculum at university and the secondary level. Within the last 30 years, the subject of geography has lived a turbulent life in secondary school (STX and HF). The relation between human and physical geography has been in focus especially. In the beginning of the 1970s, geology disappeared from the school subject of geography and physical geography could only be included to explain cultural problems. Thereby, human geography alone denoted the subject (Dolin 2007). In the 1980s, the role of geography in secondary school was threatened and the number of hours was reduced significantly. However, today the relation between human and physical geography is equal. With the reform of 2004 (known as the Gymnasireformen 2005), geography was once again threatened and almost did not survive in secondary schools. The argument was that geographical knowledge was obtained in other subjects. However, due to a focus on geography as a science subject geography survived even more reduced and now under the name physical geography.

⁴ In Denmark there are four types of upper-secondary schools giving equal opportunity to enter the higher education system (HTX, HHX, HF and STX). STX is a non-vocational general type of upper secondary school; HF is the same but focused and can be completed in two years compared with three years for STX. Both HHX and HTX are vocational schools specializing in business and science and technology respectively. Only at STX and HF is geography part of the curriculum.

This has meant a restructuring of learning objectives and a focus on new teaching approaches (Volkers 2007).

There has been a dual relation between the development of geography at the universities and the secondary level. It has been argued that the ‘collapse’ of the subject in secondary school was the result of the extensive discussions in the 1970s about the identity of geography at the university level as regards human and physical geography (Dolin 2007). However, the changes in the secondary geography curriculum have also led to changes in the university curriculum. For example, the secondary school reform of 2005 and later changes have served as leverage at the university by introducing structural changes to curricula in order to comply with upper secondary school teacher requirements (BEK nr 692 af 23/06/2010, and BEK nr 735 af 22/06/2010).

At all three universities (Copenhagen, Roskilde and Aalborg), where an education in geography is offered, both physical and human geography are taught. Thus, both research and teaching in physical and human geography take place.

Geography at Copenhagen is organised to allow students to have a minor subject besides geography (and vice versa). Therefore, 45 of 180 ECTS at the undergraduate level are allocated to a subdiscipline to meet the upper secondary teacher requirements. The structure of the study complies with secondary school reform to educate two disciplinary teachers. Thus, bachelor students are introduced to core geographical theories and methods that correlate themes required to educate upper secondary school teachers. Based on problem-based analysis students are introduced to obligatory courses in physical and human geography. Obligatory courses for undergraduate students are, among others, Basic Statistics (7.5 ECTS), the Physical & Human Landscape (15 ECTS), GIS & Cartography (7.5 ECTS) and Climate, Soil & Water (7.5 ECTS) (Study regulation 2009a).

At graduate level secondary school requirements no longer give precedence to courses offered. Students choose one of the six specialisations offered that differentiate the Master of Science in Geography & Geoinformatics into the following qualification profiles: 1) Ecological Climatology and Climate Changes, 2) Geomorphology, Processes and Landscapes, 3) Global Environmental Soil Sciences, 4) Remote Sensing of the Bio-Geosphere, 5) Environment, Society and Development and 6) Transformation of Cities and Landscapes (Study regulation, 2009b). Thus, the education is structured to give core geographical qualifications supplemented with qualification profiles of the student’s choice.

As for fieldwork requirements in study regulations at the University of Copenhagen, two obligatory field courses are given at bachelor level. The organisational structure does not per se encourage interdisciplinary links between physical and human geography – one field course is given in human (7.5 ECTS) and physical (7.5 ECTS) geography respectively. At graduate level 15 ECTS are allocated to six optional courses of which four are field courses: Field- and method course (15 ECTS), Field and method course SLUSE (15 ECTS), Faces analysis and field techniques (7.5 ECTS) and Process studies and field technique (7.5 ECTS) (Study regulation 2009b).

Geography at Roskilde is strongly influenced by the university's tradition in problem-based learning (PBL) since its birth in 1972. Today, all education is still organised around one and a half year's interdisciplinary study either within arts and humanities, social sciences, natural sciences or human-technological sciences. For this reason, specialisation within geography takes place after one and a half years of study. Moreover, students supplement geography with another discipline at bachelor and Master level. The diversity and multivariable skills among the students gives a profound interdisciplinary milieu when introduced to geography. This is continued in geography; the study regulation requires problem-based group work so that students 'collaborate with each other – also with students from another scientific background (...) which fosters different perspectives and resources to solve a scientific problem' (Study regulation 2006:23). Secondly, the organisational structure of the education seeks to establish overlapping functions between physical and human geography: 'students should be able to look upon scientific problems and solutions in an interdisciplinary approach – not only from particular disciplinary premises, but also by including relevant theories, methods and philosophical interpretations from related disciplines' (Study regulation 2006:23). Thus, students have courses, seminars and lectures accounting for 15 ECTS each term and problem-based group work accounting for 15 ECTS, in which students under supervision specialise in a geographical topic of their choice.

As regards fieldwork requirements, one obligatory field course (7.5 ECTS) encompasses 'further specialisation within cultural, human and physical field methods' (Study regulation 2006:12). The course requires 2–3 weeks of fieldwork in another country plus planning and reporting. It is worthwhile emphasising that the fieldcourse is not separated in terms of human and physical geography as is the case at Copenhagen and Aalborg universities. In practice, however, physical and human geographers tend to form groups and lecturing activities within their particular discipline during the course.

Geography at Aalborg University has a similar model; problem-based learning (PBL) as a fundamental learning approach throughout education. However, geography remains a full-time study both at undergraduate and graduate level. Hence, the education of geographers is organized around problem-based group-work (Study regulation 2011). Geography is a five-year study, however; education is structured in such a way as to allow students to have a minor or major subject besides geography in order to meet the upper secondary school teacher requirements. You may choose to study geography for one and a half years and another discipline for three and a half years (or vice versa), or geography for five years. In relation to fieldwork requirements, in the study regulation we find a similar structure as that at Copenhagen University. At bachelor level two obligatory 5 ECTS courses are offered, in human and physical geography. At graduate level two obligatory courses are offered in physical geography which includes fieldwork methods (Applied Methods in Physical Geography, 20 ECTS and Measurement Technology and Data Acquisition, 5 ECTS). Both courses emphasize the ability of students to: 'plan a literature review and field and/or laboratory work. [...] and plan and carry out the measurement program for field and laboratory measurements' (Study regulation 2010c:10). There are no obligatory fieldcourses or requirements for the Master in Integrative Geography (Study Regulation 2010a).

In terms of all three university educational programmes in geography, the fieldwork supplements the students field projects as well as problem-based groupwork projects, bachelor and master theses. Despite quite different organisational structures, as regards how fieldwork is introduced to future geographers or the educational structure in general, only little variation in learning objectives is identified between the three educations in Denmark. Thus, the ability to identify and methodologically process complex geographical questions as well as understand spatial differentiation and how physical and social structures work in different scales remain core requirements. Moreover, students should be able to evaluate critically their own geographical qualifications and relation to other fields of science, and differentiation in theory, methods and empirical data from neighbouring disciplinary constructs (Study regulation, Copenhagen 2009b:3, Roskilde 2006:23, Aalborg 2011:4). Furthermore, it is emphasised that becoming a geographer allows students to plan their own learning strategies, visions and contexts that lead to critical and independent geographical analysis. Differentiation and the mobility of learning- and interpersonal skills are accentuated geographical qualifications, which enable students to collaborate in interdisciplinary teams as well as reflect upon their own field in relation to associated disciplines. These competences are, according to the interviewing material, in particular, associated with inclusion of fieldwork in the education of geographers (Interview 2012).

Fieldwork as a learning methodology

In the following, we examine the notions of fieldwork among current university geographers in Denmark. We found that the ways in which geographers perceive and conduct fieldwork are endlessly varied. Still, it is possible to condense common and conflicting fieldwork characteristics that are considered valuable in becoming a geographer. Fieldwork means being situated in a multitude of interconnections that allow students to reflect upon their own geographical imaginations; the context or community they are situated in brings together a range of tacit knowledge, everyday knowledge and expert knowledge (interview 2012). Through a multitude of interactions the fieldworker slowly develops a sense of what should be considered important, contradictory or repulsive: 'Fieldwork is like a handicraft; one needs to learn through education, especially students should obtain a critical attitude towards their field and their own situatedness in compiling field data' (Interview 2012).

Fieldwork is a craft that students should excel in, because it is a learning methodology that can be used to build up a good sense of geo-spatial appreciation. Thus, Danish university geographers strongly advocate the practice of fieldwork as a means of allowing students systematically and critically to make their own experiences of spatiality and exploration of an area. They should be trained to conduct this independently and be able to combine a multitude of probe samplings and triangulation strategies to understand complex correlations in their contextuality (Interview 2012).

One of the major recurrences in the interviewing material is that the education of geographers would be impoverished if fieldwork were eliminated. Even for those geographers who said that one could in principle become a geographer without fieldwork, they also contemplate that one miss an dimension, even if this missing

dimension remains undefined. To the question 'Can you become a geographer without doing fieldwork during your education?' 23 answered 'no', 1 answered 'yes' and 7 answered 'yes' but it will be an impoverished education (Interview 2012). This missing dimension is not at all easy to capture and hold an element of tacit knowledge or cultural schooling that few of us reflect upon in our daily practices as geographers. Yet, fieldwork as a learning methodology holds a strong position and only one geographer did not find fieldwork necessary in becoming a geographer, which corresponds to the findings by Scott, Fuller & Gaskin (2006). This missing dimension is represented in many forms and connotes a mysterious experience. It involves being visually confronted with the field and thus to ascertain synchronously different and liveable geographical representations: 'students always become more enthusiastic after being in the field; one suddenly just understands mathematical formulas much better having seen the natural laws at work right in front of you' (Interview 2012). The mysterious learning element represented in the interviews corresponds to the findings of a British review: 'fieldwork gives opportunities for learning which cannot be duplicated in the classroom. It greatly enhances students' understanding of geographical features and concepts, and allows students to develop specific as well as general skills' (HMI 1992, here quoted in Fuller et al. 2006:199).

Knowledge and processes of realization are mutually associated with a given learning environment. Realization is often recognized as something tacit and is actively influenced by the learning environment (Illeris 2012). In the following, we view fieldwork as a learning methodology, which demonstrates a multitude of learning processes that take place as a hybridity between different 'kinds' of information. Tacit knowledge experiences, we argue, are important learning outcomes of fieldwork.

This shared and tacit knowledge are difficult to define, yet learning to codify knowledge in the interaction with the field and understanding the different spatio-temporal dynamics and processes give rise to experiencing the richness of the learning process during fieldwork. The following sections use Zelinsky's (2001) categories of fieldwork to capture and elaborate the different traditions regarded as important by Danish university geographers in the 'tacitly of becoming' a geographer through fieldwork. As mentioned, according to Zelinsky, there are three general categories of fieldwork: fieldwork as a commercialised practice with the normative agenda to support the interests of a client; fieldwork as a scientific activity to solve a research question with reflective rather than commercial ambition; and fieldwork as an adhoc, impulsive and informal practice (Zelinsky 2001). Only the two latter conceptions of fieldwork were identified in the interviewing material. We discuss Zelinsky's categories by condensing three subordinate categories of fieldwork into a learning methodology. These are: fieldwork as an outdoor laboratory, fieldwork as sensuous realisation and fieldwork as a meta-theoretical practice (as shown in Table 1).

Table 1.

Three categories of fieldwork as a learning methodology found among Danish geographers in higher education.

Fieldwork as an outdoor laboratory	Fieldwork as a sensuous realization	Fieldwork as a meta-theoretical practice
<p><i>Characteristics</i></p> <p>The transference of the laboratory to the field is more than merely upscaling the laboratory. Fieldwork as an outdoor laboratory offers an approach not possible to duplicate at home. The contextuality of the field is actively being involved in data sampling, processing and analysis. From spatio-temporal 'aha' erlebnis towards erfahrung.</p>	<p><i>Characteristics</i></p> <p>The flaneur fieldworker is an archetype to read spatial representations. An approach in which senses and experiencing the place are actively involved in the fieldwork, not only the intellect. Intuition and imagining the field as active information carrier is possible when schemes and control are set aside.</p>	<p><i>Characteristics</i></p> <p>Fieldwork as a dialectical approach to involve actively relations between theory and practice. Fieldwork is a process of learning how to operationalise theory, qualitatively or quantitatively, as a standardised, schematic analytical approach, though sometimes revised under fieldwork.</p>
<p><i>Example by quotation</i></p> <p>'Much can be learned theoretically from books, classes and so on, but to develop theoretical work into understandings, it be climatological, geological or hydrological processes in nature, one has to be in the field to understand the full potential of spatial analysis'</p>	<p><i>Example by quotation</i></p> <p>'To be able to actively involve the field as information carrier, and to understand the interactive process between field, practice and theory'.</p>	<p><i>Example by quotation</i></p> <p>'The fulfilment of theory and operationalisation of theoretical concepts in the field'.</p>

In the following subsections, we explore the three categories of fieldwork as a learning methodology (shown in Table 1).

Fieldwork as an outdoor laboratory

Fieldwork as an outdoor laboratory is expressed in two forms. The first is a one-to-one constellation of the laboratory, meaning that the laboratory is simply transferred to the field. The second form conceives of fieldwork as a methodology that offers the scientists an approach that is not possible to copy or upscale in the laboratory. Some

sort of contextual element is catalysed into the data. It is necessary to understand under which contextual and geospatial circumstances the data are collected in order to be able to interpret the spatiality and contextual elements in analysing such data (Interview 2012). Fieldwork as an outdoor laboratory is a widely used metaphor in the interview material. Further, it is most commonly, but not exclusively, mentioned by geographers with an inclination towards physical geography. Two main configurations can be identified. One presents fieldwork as a method that gives access to objective field data. Fieldwork, in this respect, is associated with the act of objective and concise data collection; to know how to measure correctly and set up your instruments, while considering space, time and scale (Interview 2012). The second characteristic assumes that scientific objectification also becomes an internalised personal process to be able to collect data objectively; to learn how to address difficulties in data collection can only be learned through analytical trials and experiences. Here, an element of 'Aha Erlebnis' is involved in the fieldwork process that somehow allows the fieldworker to explore observations and insights simultaneously that would not have been expected (Interview 2012). Thus, fieldwork as an outdoor laboratory suggests that fieldwork actively brings into being the context dependent elements into constructions of context independent elements or general laws: 'One just better understands natural laws at play when standing out there' (Interview 2012). What comes into play is some sort of scientific sensuousness in experiencing the field and understanding relations between wholes and parts.

Fieldwork as sensuous realisation

Fieldwork as sensuous realisation corresponds to Zelinsky's last category of fieldwork as an ad hoc based practice (Zelinsky 2001). It is the most difficult category to grasp, but also the most intriguing in that the realisation process holds a huge amount of tacit knowledge. This perception of fieldwork is also widely present in our empirical material both from geographers inclined towards human geography and towards physical geography. In this regard, fieldwork is simply an ad hoc, impulsive effort, an adventure into unknown places. The flaneur fieldworker is an archetype used by Zelinsky to characterise fieldwork: 'altogether informal, sometimes hovering on the margins of consciousness, a sensibility ecumenically attuned to all innovations in the sensed environment, to every manner of loss, gain, and the unexpected, dedicated to absorbing a dynamic world without a set agenda' (Zelinsky 2001:7). The flaneurial fieldwork most readily comes into our minds when new countries, cultures and places are visited for the very first time. However, we may as well be in our own neighbourhood. It is how geographers record the field through the senses, and where the senses are actively involved in the fieldwork, not only the intellect. This enables the fieldworker 'to be able to actively involve the field as information carrier, and to understand the interactive process between field, practice and theory' (Interview 2012). What we suggest here, is that the informal learning environment produce a sensuous realisation in which socio-spatial imagination becomes a constitutive force of representing the field visually in the nexus between everyday knowledge, tacit knowledge and professional knowledge: 'The landscape is perceived differently for people who live and work there, e.g. as spaces of production, whereas visitors may explore it as a space of recreation. To understand such

very different interpretations of the very same space one needs to consider how I myself read space through senses. When I try to understand how I myself understand the field, and how I myself absorb and read space all my senses are actively involved. I also hear, smell and feel space so to speak' (Interview 2012).

Fieldwork becomes an intuitive, simultaneous and continued process in bringing together all these different forms of socio-spatial information. Some may claim that fieldwork as sensuous realisation is neither methodologically systematic, stringent nor objective, but fieldwork as sensuous realisation begins where scientific standards end, where it is no longer possible to argue objectively for all the dexterity and skills the scientific work is based upon.

Fieldwork as a meta-theoretical practice

Zelinsky's second category describes a fieldwork approach applied to solve a scientific problem. Although the two previous characteristics of fieldwork also suggest different meta-epistemological assumptions of ways to learn the scientific practice of conducting fieldwork, they do not grasp the duality of theory and practice. Among the interviewed university geographers, such a duality is grasped in the inherent notion of fieldwork as a constant search for new ways of understanding the problem and associated methods. By way of example, this involves learning to observe detail and wholes, in realising how things are interconnected, reconnected or detached under different circumstances: 'the fulfilment of theory and operationalisation of theoretical concepts in the field' (Interview 2012). In other words, 'in fieldwork you learn to operationalise theory, and to critically scrutinise your own or others' quantitative and qualitative representations of an area' (Interview 2012). However, it is also to synthesise, as others mentioned, using the senses of hearing, seeing and feeling: 'geography has in its identity that you learn a whole lot of your understanding of the world through fieldwork' (Interview 2012). This notion of fieldwork is the less represented in our empirical material.

Fieldwork may be standardised, e.g. in understanding plant succession as climate change. Sometimes the field turns out to be different than was assumed in the field plan; this is why new ways need to be integrated into the existing schema (Zelinsky 2001). A number of the interviewed university geographers mention field diary as an important process of realisation. Keeping a field diary is an important way of being aware of how new knowledge develops and becomes internalised during fieldwork. Looking back at the first field notes sometimes make the first field experiences simple, obvious, or self-evident. The diary, however, captures the tacit learning involved in fieldwork, and can reveal the significance of students' learning processes during fieldwork (Interview 2012). The field diary metaphor in the interviews becomes a manifestation of continuous interplay between theory and practice.

Conclusion and Discussion

Based on an empirical study of university geographers involved in the education of geographers in higher education programmes in Denmark and their perception of the role of fieldwork in the education of future geographers, we found three subcategories

of fieldwork as a learning methodology: fieldwork as an outdoor laboratory, fieldwork as sensuous realisation and fieldwork as a meta-theoretical practice.

Interestingly, the three empirical perceptions of fieldwork were not allocated to different academics or traditions, meaning that the individual researcher often encompassed more than one view of fieldwork either in relation to his or her own research or in relation to the education of future geographers. For this reason, the categories of fieldwork presented among university geographers at Danish Universities do not support the often claimed dichotomy between physical and human geography. This points towards the openness of geography as a synthesis discipline even though not realised in the individual researcher's own research practice – an openness that is also included in the teaching practice of fieldwork. Thus, when we tend to divide geography thematically into either human or physical traditions, in human-nature, earth science or spatio chronological orientations, these dichotomies express contested ideas of fieldwork that do not necessarily coincide with the perceptions of fieldwork among university geographers educating future secondary school teachers. This has bearings not only on the education of geographers at the universities but also the Danish secondary school where geography is presently taught as physical geography with a significant amount of geology. In such a context, we find that fieldwork has a role to play in understanding geography as a subject that can transcend the gap between science and social science subjects. In this way, fieldwork demonstrates that real world problems can be addressed by using both physical and human geography, and that the whole is greater than the individual parts.

In our findings, one perception of fieldwork seems to align with such notion of fieldwork as transcending: 'One just better understands.....when standing out there' point of view. This perception of the value of fieldwork includes quite different sensitivities for the outcome of fieldwork. As regards moving the laboratory outside, 'something just happens' that change the perception towards the view that the meaning of fieldwork is to co-construct meaning in interrelation with the field; the whole is greater than the sum of the parts and the understanding transcends the particularity of the situation. The whole spectrum of these views acknowledges that being in the field adds something and that this something is important in the education of future geographers. In this way, the fieldwork learning objective goes beyond what can be promulgated in curricula constructs, and becoming a geographer is also actively being involved in space.

If we turn to the literature, Scott, Fuller & Gaskin (2006) find that lecturers' perception of fieldwork was that of a pedagogical application that supports students to contextualise theory and actively helps them to carry a problem-based approach. However, while none of the respondents in Scott, Fuller & Gaskin (2006) related fieldwork to experimental learning, this is the case for the three categories of fieldwork as a learning methodology developed in this paper. Also, in the studies of Stokes, Magnier & Weaver (2011) and Wall & Speake (2012) the perception of fieldwork among university research staff is found to vary. This points to the importance of conducting studies of perceptions of fieldwork among staff in different cultural settings because as we started to address in this paper, different cultural settings give precedence

to various elements of geography also within the use of fieldwork. This is important if we are, as argued by Hill and Woodland (2002), to substantiate its place in higher education.

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