THE POWER OF GEOGRAPHICAL THINKING

IGU-CGE/UCL IOE Geography Education Conference
April 13-15 2015
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Conference Programme

Monday 13th April

9.00-9.10  Introduction and Welcome  Clare Brooks

Session 1  Paper sessions
Chair: David Lambert

9.10-9.30  Multicultural fieldwork to promote students’ intercultural competence  Nina Brendel

9.30-9.50  Listening to London’s Young Voices  Lauren Hammond

9.50-10.10  Field work and geographic thinking amongst senior secondary students in Kano, Nigeria: the role of teachers  Naratu Mohammed

10.10-10.30  Thinking geographically and spatial thinking in the Swedish curriculum in geography  David Orbring

10.40-11.00  Break

11.00-12.30  Keynote
Do Geographers Count (and should they?). Quantitative methods and the spectre of chi-square.

                    Rich Harris

12.30-1.30  Lunch

Session 2  Paper sessions
Chair: David Mitchell

1.30-1.50  The future in geographical thinking  Iris Pauw, Tine Beneker

1.50-2.10  Thinking space geographically  Alois Hynek, Jaroslav Vavra

2.10-2.30  Geographical thinking and its role in climate change education: A case of Singapore  Chew Hung Chang, Liberty Pascua

2.30-2.50  English geography textbook authors’ perspectives on developing pupils’ geographical knowledge and thinking  Simon Catling, Jongwon Lee

2.50-3.10  Geography teachers between formal training and teaching practices  Andoni Arenas, Maria Jose Otera Victor Salinas

3.10-3.30  Break

Session 3  Paper sessions
Chair: Sarah Bednarz

3.30-3.50  How geography as a school subject is defined in Singapore  Tricia Seow

3.50-4.10  Teach to develop geographical thinking  Felisabela Martins

4.10-4.30  International differences in thinking geographically and why it matters  Clare Brooks

4.30-4.50  CyberGIS and geographic thinking  Forrest Bowlick

5.00 onwards  Drinks reception
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Details of Wednesday 15th April on page 36.
Keynote Speakers

Monday 13th March
Prof Rich Harris
University of Bristol

Rich Harris is a Professor of Quantitative Social Geography at the University of Bristol, director of the University of Bristol’s Q-Step Centre for undergraduate, quantitative social science, and winner of the 2014 Royal Geographical Society (with IBG) Taylor & Francis Award for excellence in the promotion and practice of teaching quantitative methods. Recent recent work has been in the geographies of education and learning, focusing on choice and markets in educational systems, measures of social and ethnic segregation, ways to support the transition of pupils from primary to secondary schools, widening participation within universities, and on supporting quantitative and statistical literacy in quantitative social science. He was a member of the QAA Benchmark review panel for geography and also the A Level Content Advisory Board.

Tuesday 14th March
Prof Sue Brooks
Birkbeck, University of London

Sue graduated from the University of Cambridge in 1984, studied for a PGCE and followed this with 2 years of secondary school teaching before commencing her PhD in 1987. This was awarded in 1991 and was about modelling landslides with a focus on the way climate change alters landslide occurrence. Recently Sue has developed the modelling of rapidly-retreating soft rock cliffs by applying GIS techniques to historic, current and future periods. This work is ongoing and focussed around the retreating shorelines of East Anglia where vulnerable coastal communities live. The 5-6th December storm surge was the biggest for 60 years and Sue has conducted collaborative research with the Cambridge Coastal Research Unit on evaluating shoreline responses to the surge.
Multicultural fieldwork to promote students' intercultural competence

N. Brendel, G. Schrüfera, University of Münster
F. Akşitb, S. Akşitb, Pamukkale University, Denizli

In an increasingly interconnected Europe, geography teachers are faced more than ever with intercultural challenges in their everyday work. To face those challenges, students should experience working in multicultural groups during their university studies (Popov et al 2012) and gain intercultural competence for their prospective work as a Geography teacher.

Therefore, this study seeks to determine factors that foster intercultural competence of student teachers of Geography in Higher Education. Based on a one-week multicultural field excursion to the surroundings of Kayseri (Turkey), we studied the effects of multicultural fieldwork on student teachers from two European universities (University of Münster, Germany & Erciyes University, Turkey). Using self-regulated learning methods, the 8 German and 8 Turkish students were challenged to evaluate the sustainable development of tourism in the area of Kayseri and Cappadocia.

In order to analyse the changes in the student teachers' intercultural competence, we interviewed students about their feelings and behavior during multicultural group work using qualitative semi-structured interviews. As interviews were held in the students' native language (German or Turkish), we first had to translate the transcripts into English in order to analyze the data in our team of multicultural researchers. Using the method of content analysis by Mayring (2010), we then applied Deardorff’s Pyramid Model of Intercultural Competence (Deardorff 2006) to the results.

Our findings strongly indicate that multicultural fieldwork fosters intercultural learning on a personal level. Crucial factors revealed by this study to promote student teachers' intercultural competence on multicultural fieldtrips were (1) inquiry-based learning in constructivist learning settings, (2) self-regulated work in small multicultural groups, and (3) regular evaluation and well-prepared evaluation and reflection sessions.

Based on these findings, we argue that multicultural fieldwork is a very suitable measure to support student teachers’ intercultural competence and should be integrated into European curricula of geography teacher education. We believe that multicultural fieldwork, as an integral part of Geographic Higher Education, will equip future geography teachers with the intercultural competence necessary for teaching in a diverse and tolerant Europe.


Listening to London’s young voices

Lauren Hammond, UCL Institute of Education

This paper discusses how narratives can be used to investigate young people’s geographies and imaginations of London. Drawing on work on narratives, place and young people’s geographies, it argues that understanding the role of the geographical imagination in the conceptualization of place, is key to exploring how place is both constructed and understood, and that narratives about place are a key part in the construction of our geographical imagination of place. Massey (2008, page 24) asks ‘whose geography?’ in regards to the conceptualization of London, and the spaces within it. With academic work on young people’s geographies showing that young people have their own understanding of the world (Skelton and Valentine, 1998; Freeman and Tranter, 2011; Ward 1990), this paper argues that by failing to explore young people’s perspectives of the city, then we are neglecting to consider and examine a whole section of the populations’ experience and understanding of London.

The research explored a small group of young people’s in-depth narratives of their experience(s) and imagination(s) of London. Data was collected in storytelling group that offered the participants an opportunity to share real life experiences of place, and discuss mediated discourses about London. The use of group work supports the idea that our way of life reflects shared meanings and modes of discourse (Bruner, 1990), meaning people construct their idea of selfhood in response to the culture and society they live within. The exploration of other discourses and representations of place, is based on Goodson’s (2013) process of triangulation, where life stories, documentary resources and other testimonies are considered of equal weighting in the creation of a narrative. As such, it aimed to investigate the following research questions:

- To investigate young people’s imagination and personal geographies of London
- To explore the use of narrative as a methodology for researching young people’s geographies and imaginations of place
- To research how imagination links to the construction of place.

This paper will reflect on the study to date, including explorations of the literature, research design and methodology, and the early stages of analysis and early findings of the research. It will also reflect upon and discuss, how teachers can use young people’s geographical imaginations to explore the concept of place.
Fieldwork can be one of the most exciting parts of the process of geography, by generating new knowledge and offering insights that may force a student to think about things in new ways. If properly planned and executed, Geographical fieldwork has been argued to be particularly useful in the development of insight, attainment of intellectual, technical achievements and development of empathy in students. In view of this argument therefore geographical fieldwork becomes an inalienable and corporate part of teaching and learning process in geography. Despite the value of fieldwork as a teaching method, most public schools in the region fail to make adequate use of this valuable method. Some of the questions raised by the researcher are: which geographic concepts are better taught using fieldwork? Is there a difference in the pre and post test scores of students in the concepts taught? How can teachers make effective use of fieldwork? This work therefore investigates the role of fieldwork in the attainment of cognitive, affective and psycho motor domains in senior secondary students in parts of Kano State. To achieve this, purposive sampling technique was used to select Nassarawa zone out of the six education zones in metropolitan Kano. Stratified random sampling was used to select three public and three private schools each from the four cardinal directions. Stratified random sampling was employed to select 50 students from each of the sampled schools. The samples were pre tested on some selected concepts in physical geography before going to the field. The pre and post field questions were meant to test for the attainment of cognitive, affective and psycho-motor domains in students. The pre and the post fieldwork tests were analysed using mean, standard deviation and analysis of variance. The results show significant difference in the mean scores of students for the pre and post test. The study found among other things, that the field work was better in enhancing students understanding of geographical concepts and appreciation of the natural environment, it was also found that the involvement of students in group work was seen as a step in the development of leadership roles amongst them. One of the major constraints to the effectiveness of field was inadequate funds, and large number of students and lack of adequate preparation on the parts of the teachers in public schools.
Thinking geographically and Spatial thinking in the Swedish curriculum in geography

David Örbring, Lund University

In my paper session I will discuss my dissertation, in which I investigate how the Swedish curriculum in geography for compulsory school is constructed. I also analyse the view of knowledge in the curriculum and put it in an international perspective. Another important aspect is studying the intentions behind the policy documents for geography teachers. Furthermore, in my research I analyse how geography teachers describe their trying to develop students’ geographical abilities.

The research is a case study, consisting of various qualitative methods: reflections of recorded lessons together with the teachers, interviews with teachers and interviews with key people involved in the process of creating the policy documents. It also involves analyses of policy documents. I use phenomenography to analyse the interviews and reflections of video material and curriculum theory to analyse the policy documents and the intentions behind them.

My research question relevant for this conference:

What is ability in geographical education in Sweden? How has the concept been defined and evolved in comparison with international debates in geographical education?

Relevant for my research is literature about spatial thinking, for example Learning to think spatially from National Academies (2006), and works relevant for geographical thinking as Peter Jackson’s (2006) article Thinking Geographically and Susan Hanson’s (2004) writing about Geographical Advantage. Also relevant is the transatlantic collaboration, which aims to explore and create a conversation about GeoCapabilities.

In the paper session I will give an account of an analysis of the Swedish curriculum of how geographical thinking differs from spatial thinking and the roles physical and human geography play in developing geographical thinking.

I have done interviews with one of authors of the curriculum and responsible people at the National Agency for education. I have also gathered policy documents from ministries of education in Sweden, from the National Agency for education and from the interviewed author of the curriculum. In the conference I will present some of the research findings about the analysis of this material and how it can contribute to knowledge about thinking geographically and spatial thinking.
Thinking geographically can be summarized as using geographical vocabulary and grammar for ‘a state of the planet awareness’. It helps us to see connections between places and scales that others frequently miss. It provides means to grasp a complex and dynamic world. Besides the perspective of scale, change over time is also an aspect of the complexity of geographical issues. Looking back is often part of geographical enquiry but contemporary education also needs looking forward. Our research project focuses on the development of a contemporary geographical futures pedagogy.

Firstly, we analyzed the approach of the future in authoritative documents on education from OECD, EU, USA and the Netherlands. These visions focus on rather neoliberal, market oriented skills, so called 21st century skill initiatives. Of course geography contributes to preparedness for the labor market, but in geography education, we can get further. We can work on appreciative futures enquiry, instead of depreciative, subjective assumptions of probable futures. This makes the futures part of the time layer more insightful. In addition to the literature of 21st century skills, the field of Futures Education was studied.

Secondly, we preformed a content analyses of the Dutch upper secondary geography curriculum from a Futures Education perspective (thinking in alternative futures, characteristics of a futures pedagogy). A future perspective is obvious in the vision behind the curriculum, but it becomes thinner and less open when elaborated in the syllabus, textbooks and examinations. From challenging future relevant issues and a call for scenario thinking, it changes into a presentation of a fixed and often negative future. In a focus group meeting with stakeholders of the geography educators community there is recognition of the importance of a futures perspective. But there is also uncertainty and unfamiliarity, when it comes to implementing a futures perspective. To enable geography teachers to implement or improve a futures perspective in their education, more clarity about the function and form is necessary.

The third step will be an educational design research. We will apply futures oriented geographical concepts (change, interdependency) and pedagogical tools (scenario thinking) to a design study on the theme of ‘the city of the future’, part of the Dutch curriculum. In our presentation at the conference we would like to discuss our design principles, based on step one and two and applied to this specific theme and context.

[part one will be published in IRGEE, part two in Futures, part three starts from December]
Thinking space geographically

Alois Hynek & Jaroslav Vávra, Masaryk University

The Economist, October 27, 2012, special report Geography and Technology, wrote: “Geography matters as much as ever, despite the digital revolution. The digital and the physical world are interacting ever more closely, they are becoming one”. D.Sinton (2011) mentions “Spatial thinking is the ability to visualize and interpret location, position, distance, direction, relationships, movement, and change, over space” as well as “geographical learning requires a geographical lens, an approach to inquiry that is grounded in spatial thinking.” What is space? What is the earth becoming from a geographical perspective, especially after events such as Breivik’s assault? Three aspects of lived space will be considered: the user, the activity and the image produced, and the experience or sense of place as distinct from the larger context. (Stout 2008). Space is a continual multiplicity, in poetic genre - multifaceted jewel, and arousing the question: which facets are geographical? Moreover, placed in geographical education not omitting citizenship, ethics. Thinking space geographically means, in Hartshornean diction, which facets of space are geographers studying? That is space in geographical terms – places, areas/territories/aquatories, landscapes, regions, and globions. However the basic globions are variants of the Earth’s ecosphere in the sense of F.Milkov (1990). We can understand them as Nature or as environment, and with respect to sustainability as a set of ecosystems delivering us ecosystem services. Many geographers claim that Geography is the study of relations between society and the natural/physical environment. Humans have been creating their own realms, according to de Blij, Muller (2007). Cloke et al. (2014, 125-7) present geography as writing the Earth, writing the World with approaches: description, experience, interpretation, explanation, critique and conceptually framed for investigating issues, e.g. poverty into empiricism, positivism, phenomenology, existentialism, pragmatism, marxism, post-structuralism, feminism. We deal with representations as pictures, charts, graphs, maps in geographical education. After J.Brunner (1966) any domain of knowledge can be represented in three ways: enactive, iconic, symbolic. But geography is a field discipline: consciousness of the place in the mind includes perception, thinking, judgement, and memory. The geographic cognition and metacognition are also subsumed in GIS technologies. E.Thompson (2007) emphasises enactive as the interactions between mind, body and the environment, seeing them all as inseparably intertwined in mental processes. In the case of landscape J.Wiley (in Agnew, Livingstone, 2011) distinguishes three principal human geographical understandings of landscape: as material record, as way of seeing, and as dwelling.
The development of learners’ geographical thinking about climate change rests upon teachers’ role as curriculum makers in engaging the context of learning. The literature shows how segmented students’ understanding of the issue is, despite heightened awareness about climate change. Typically there is confusion and cynicism about the phenomenon and students’ role in environmental stewardship (Schreiner, Henriksen & Hansen 2005; Ahmad, Rahim, Pawanteh, & Ahmad 2012). They regard the phenomenon as a difficult and overwhelming matter that is beyond the capacity and control of a young person (Kuo 2010). In adopting Activity Theory (Leont’ev, 1974) as a framework, geographical thinking is conceptualised as the production process in mediating the students’ (subject) learning about climate change (object) with a view to help them see the relevance of the issue to their lives (goal). The approach highlights the tensions surrounding human-environment relationship, and the chasms that separate mere awareness, understanding and agency. To understand how teachers can use geographical thinking in this activity system, the inquiry was operationalised through the research question of “How can geographical thinking help students understand climate change?”. Data was gathered through in-depth interviews with 27 high school students who have been exposed to the topic in both lower and upper secondary level Geography. The findings show that there are three key contradictions in the activity system that prevent the students from developing an understanding of climate change that they will see as relevant to their lives, for which they will consequently take action. The first arises from misconceptions about the topic, which may not even be apparent to the teacher. Secondly, the apathy that arises from a flawed understanding that the issue is irrelevant to their imagined reality, discourages further engagement on the topic. Thirdly, education systems that are preoccupied with standardised testing discourage any motivation to learn more about the issue. Indeed, the meanings that we hold about climate change are determined in significant parts by our embeddedness in our social and cultural contexts (Norgaard, 2006; Carolan, 2010). In combination, these three contradictions present impediments to translating geographical knowledge into understandings about climate change. The paper posits that the teachers as curriculum makers and enactors are central to the development of geographic thinking, to help students become more aware of their role in the human-environment relationship.
The purpose of teaching and learning geography lies in developing pupils’ geographical knowledge and understanding and, therefore, their geographical thinking. A resource often used in classrooms to support geography’s teaching and learning is a textbook. Much research into the nature and uses of school geography textbooks as teaching resources has taken place over the years. While textbook use and concerns about their content have been examined, next to nothing is known of the perspectives of their authors. This gap in the research literature opened up consideration of writers’ motivations, subject and pedagogical expertise, and the influences and constraints on textbook writing. Taking an interpretivist approach, this study examined the views of a sample of English authors of primary and secondary school geography textbooks. The focus was on their experiences as textbook authors, their motivations for and expertise in textbook writing, their valuing of geographical learning, the influences on and challenges faced in textbook development, and their sense of the future for geography textbooks. This qualitative study was questionnaire-based, using open-ended questions to seek author’s perspectives. Convenience sampling was used in that the researchers either knew of or knew personally all the English textbook authors approached. Seven of the ten authors invited to participate agreed. Each provided detailed responses to the questionnaire. Applying a constant comparison analysis, a number of findings emerged. These indicated that this sample of authors valued geography for both extrinsic and intrinsic reasons, one of which was its curriculum strengths. Authors felt that vital for textbook writing are up-to-date subject, curriculum and pedagogical knowledge, alongside skills in textbook structure and design, and the capability to develop geographical understanding progressively through an individual textbook and a series. Textbook writing in England is influenced and constrained by geography national curricula and examinations and publishers’ requirements, which can enhance or inhibit the nature and quality of the sources, visual and other materials, and the learning activities included in the textbooks. Authors’ highlighting of these facets of textbook writing indicated the importance of pedagogical content knowledge and structured planning for progression to foster pupils’ geographical thinking. Geography textbook authors see a future for textbooks, though they perceive an increasing use of digital and virtual resources alongside print materials.
The school Geography curriculum is at stake in different countries at present. This research hopes to contribute to the formation of a corpus of knowledge about geography teaching, the findings-results show evidence that supports the idea that school geography teachers are, by themselves, a key factor in the answer to the main research question: what kind of geography do we teach in the school system? From this question the identification of the meaning of the geographical and didactical aspect of teaching and its manifestations, hinge on. We focused on qualitative research in 53 geographically dispersed teachers in the middle of the country, belonging to 2 important networks for teaching jobs: Red Maestros de Maestros and Microcentros Rurales applied them interviews, questionnaire characterization and classroom observations. Preliminary findings shows there is a strong tension between instances of regulated education (undergraduate and continuing) with the learning with teachers through their teaching practices, with a major impact on how a teacher develops the meanings around the main scientific concepts; and, therefore, this impact finds its way towards the classrooms and geography lessons, As well as encouraging the development of spatial thinking to be limited to a description of "enlightened" curriculum content. These findings allow us to think of the elaboration of different dimensions and categories to analyse the data, and more importantly, to think of the type of theoretical geographical metacognition that teachers develop from their experience with School Geography, something that could eventually explain the lay/expertise/expert division as an approximation towards their work as spatial subjects and as geography teachers in the school system. Finally, it is possible to assume there is a complex system of meanings in teachers, which could explain the different geographical conceptualizations as the kinds of thinking that we are promoting in Chilean students.
How Geography as a school subject is defined in Singapore

Tricia Seow, National Institute of Education, Singapore

Geography as an academic and school subject is formulated differently around the world. Geography’s place within the school curriculum varies enormously (Butt and Lambert, 2014; Assis Paula and Souza Cavalcanti, 2014). Some countries value geography as the “world discipline” (Bonnett, 2008), others focus on spatial understanding and skills such as map-reading (Bednarz 2007, Gersmehl, 2005). In addition, different academic conceptions of geography place different emphasis on the need to study the local in relation to the regional or global context (Arenas, Otero, Salinas 2014). Recent work has also suggested that how teachers interpret and understand the geography curriculum is largely influenced by what they consider geography to be, their own geographic identity and why they think young people should learn geography (Brooks, forthcoming; Arenas and Salinas, 2013; Arenas, Otero, Salinas 2014).

This paper focuses on 4-6 in-service geography teachers in Singapore. Building on the work of Barbara Stengel (1997), and her analysis of how school subjects are related to their parent disciplines, this paper will focus on how this relationship is manifest in teachers’ understanding and representation of their discipline in the school curriculum. The study utilises in-depth semi-structured individual interviews, as well as a concept maps as a heuristic device (after Seow, 2014), in order to acquire an understanding of the nature of Singapore teachers’ understandings and knowledge of geography and school geography.

In particular, the paper will investigate:

1. How experienced Singapore school teachers understand and interpret the school curriculum.

2. How teachers’ own understandings of geography, their own geographic identity and their beliefs about the purpose of a geographic education influence teachers’ understanding of the school curriculum.

3. If the subject traditions within the Singapore national context affects the ways that geography teachers think about the subject and determine its importance.
Many authors have developed work to promote a conceptual and methodological renovation of Geography (Graves, 1982; Naish, 1982; Mérene - Schoumaker, 1985 and 1992; Hugonie, 1989 and 1992; Brunet, 1992; Daudel, 1992; UGI, 1992; Andrew, 1992; Audigier, 1993 and 1995). Some differences distinguish the proposals submitted by various researchers, but all advocate a conceptual renovation of school geography, highlighting a refocused geography, "anchored in the learning of fundamental concepts and key issues on which the discipline structures its identity (Cachinho, 2000 p.71).

As advocated by Pinchemel (1982a), more than teach geography, we should educate people geographically and, therefore, focus on the development of real, social, spatial, and dynamic problems, that are capable of being applied (Hugonie, 1989). The problems under study must be analyzed in a systematic manner and this means acknowledging that relations and spatial processes change with changes in geographical scale.

We intend to focus our study on the work methodology that teachers should focus on in order to promote a sense of geographical thinking, that can foster young people's ability to think and act in the spatial environment where they live and "to become self-fulfilled and competent individuals, informed and aware citizens and critical and creative ‘knowledge workers’ " (Lambert, 2009, p.17).

The emergence of new educational paradigms centered on the learner has bestowed on school Geography a crucial role, in which the student must be involved in their own learning and be able to construct their own knowledge.

To encourage students to question geographic problems that they will later need to master as citizens, implies that teachers adopt active methods and, through the development of constructivist methodologies, promote student autonomy so that they are actors and authors of their own learning (Naish, 1992).

The presentation of physical, economic, social and environmental problems in the form of challenges and / or questions, which must be addressed through the development of explanatory hypotheses and their confirmation through the conceptualization of observed data, allows students not only to confront the knowledge they are taught with the ideas they already have, but also to operate a rational restructuring of their knowledge, based on new information.

This lecture will present examples of this working method, which resembles a scientific method, intending thus to contribute to the development of practices of teachers regarding which geography should be taught, and how it should be taught, to develop geographical thinking with a view to training geographically competent individuals.
International differences in thinking geographically, and why it matters.

Clare Brooks, UCL Institute of Education.

There have been various attempts to internationalise research within geography education. However, different interpretations of what constitutes geographical knowledge can be seen as barriers to developing internationally agreed understandings. For example, Uhlenwinkel’s work illustrates how different interpretations of geography and geographical thinking can influence pedagogical approaches preferred in different countries. This school-orientated pedagogy influences how young people are taught to value geography and how they are inducted into thinking geographically.

This paper draws upon an international project that seeks to understand how geography teachers in four countries understand the discipline of geography and how that echoes or differs from the school curriculum. Using the data collected from teachers in England, this paper focuses on the implications of these findings, by emphasising how a teacher’s understanding geography can influence how they view and teach the geography curriculum.

This work draws upon Stengel’s observations that the relationship between academic and school geography has both an epistemological and ethical dimension. In this paper I argue that the ethical dimension is a significant influence on how curriculum is interpreted, and that this is best understood with a view of the national context of geography education.
CyberGIS and Geographic Thinking

Forrest J. Bowlick, Texas A&M University

Geographic Information Systems (GIS) is no longer locked to the desktop and confined to expensive computer labs. Instead, GIS technologies reach unshackled to mobile devices, integrate massive ‘big data’ content, and exist deeply embedded into most modern cyberinfrastructure. Described as ‘CyberGIS’, the fundamental computer science and programming skills behind these expanded roles for GIS are and will become more prominently essential skills for geographers. CyberGIS is a consolidated field where the individual components of cyberinfrastructure, GIS, spatial analysis, and spatial modelling merge (Wang 2010). The increased amount, reliability, and quality of spatial data encourages greater reliance on the data for decision making, and opens more scales of analysis for investigation (Goodchild 2007). CyberGIS integrates multiple forms of data with highly powerful processing capabilities to reveal spatial relationships that would be otherwise too time or resource consuming to discover. Traditional desktop GIS is incapable of solving some problems that a CyberGIS system would easily integrate (Wang et al 2013). The fundamental educational components of CyberGIS, computer science and programming knowledge, extend to deeper roots in geography and geospatial education, GIS education, and the computer sciences.

Like many facets of GIS, geospatial, and geographic education, minimal research exists concerning curricula design, instructional best practices, and optimal student and instructor content knowledge in this Cyber-Frontier. Web mapping and cloud data access, among other CyberGIS components, may encourage new forms of geographic thinking. This paper responds to recent calls for research in geography and GIS education by addressing specific gaps in the education literature relating to GIS and programming instruction. The Road Map for 21st Century Geography Education and a recent broad agenda in geospatial technologies research (Baker et al forthcoming) clearly identify areas of investigation that this paper will explore. Specifically, this paper examines the curricula, instruction, courses and how novice geographic thinkers begin to transition to expertise in these skills. With an analysis of syllabi in CyberGIS courses, a content analysis of these syllabi will reveal topics taught in these courses, and how instructors approach these topics in various teaching constructs. An understanding of the type of content will allow for the creation of a general model of instruction. From this content and the model, connections are made to avenues of teaching geographic thinking.
**Geographical thinking through key concepts? Results of a symbiotic in-service teacher training course**

*Janis Fögele, JLU University of Giessen*

There is a growing awareness of the importance to improve geographical thinking in school Geography (Lambert 2013). Climate change, refugees and migration, globalisation and global food supply: to explain some of the most important current topics we need to focus on human and environmental issues on different scale levels, on their changes and interconnections. In short: a geographical view on these problems can help to cope with their complexity (Rhode-Jüchtern 2013).

This leads to an increased demand for the support of geographical thinking instead of an additive learning of places and subject-specific terms in school (Jackson, 2006). Using geographical key concepts to organize and intertwine content in geography lessons is supposed to be a means of creating progress concerning the students’ cumulative learning and their geographical thinking skills (Bennett 2005). Key concepts can be defined as subject-specific ideas or an analytical framework emerged from the structure of a subject to describe the most relevant processes and phenomena (Uphues 2013).

**Focus of the enquiry**

Although conceptual learning and the usage of key concepts in lesson planning are said to be important, there is no consensus on the concepts representing the core of geography (hence there are many different suggestions for geographical key concepts), and we face little implementation in everyday geography classes (Uhlenwinkel 2013). Finally there is little empirical evidence on how teachers and learners are able to successfully deal with these concepts.

For this purpose a symbiotic teacher training course was designed as an approach of mutual learning between university and school to process these questions. Within the frame of a six-month symbiotic teacher training (Parchmann et al. 2006) academics and teachers dealt with the feasibility of different key concept approaches for teachers (such as Taylor 2008; The German Educational Standards in Geography, DGfG 2012 and some further suggestions like scale or sustainability) and their potential on students’ learning.

**Research methods and findings**

In order to get access to the teachers’ understandings, perceptions and subject-specific orientations - which are crucial for their lesson planning - and as a continuous evaluation of the teacher trainings there were group discussions at different points of time that were analysed by using the documentary method (Bohnscack 2009). Thus we are able to gain information on how key concepts promote the development of geographical thinking (and which concepts are more or less applicable for teachers) and how this can be achieved through in-service trainings.
What might powerful geographical knowledge look like?

Alaric Maude, Flinders University

The aim of the paper is to identify forms of geographical knowledge that may be considered powerful, and is an outcome of my experience as the lead writer of the Australian geography curriculum. The paper is based on an analysis of the literature on powerful knowledge, mainly that produced by Michael Young. It first outlines the types of geographical knowledge, and then develops a set of criteria to identify powerful knowledge in them. Each criterion is illustrated with examples based on the content of the Australian curriculum. Some of the philosophical, epistemological and pedagogical criticisms of these criteria are noted and briefly discussed, but this is not a focus of the paper. The paper suggests that the most powerful knowledge in geography is its ways of thinking, and these are based on the subject’s major concepts. What these concepts might be is briefly examined through a review of several national geography curriculums. I also argue that spatial thinking is only one of several forms of geographical thinking, as a commentary on the theme of how geographical thinking differs from spatial thinking. Other forms of powerful geographical knowledge can be found in the application of conceptual thinking to the substantive content of the subject, in its methods of creating and testing knowledge, and in its facts. The paper concludes with comments on the value of the concept of powerful knowledge to students, teachers and the subject.
Geographical Thinking: Is it a limitation or powerful thinking?

Anke Uhlenwinkel, Humboldt-Universität zu Berlin

The problem of how to define the geographical perspective of the school subject geography is answered quite differently depending on the scientific and / or national community that is trying to make sense of the subject. Spatial thinking is thus preferred by people doing GIS or trying to link geography to STEM subjects, whereas geographical thinking explicitly includes political and moral issues. In some communities these last two approaches become so predominant, that they sometimes transmute into a-political subjectivism. As with spatial thinking subject boundaries become blurred, only ‘at the other end’. At this end geography faces the danger of becoming a Gesinnungsfach, a subject that teaches ethical convictions rather than developing knowledge and understanding.

This presentation will explore the question whether heeding subject boundaries is an unnecessary limitation to the geographical discourse or makes geography a powerful tool because focussing on the conceptual subject knowledge permits a better understanding through concentration on relevant aspects.

Drawing on examples from school geographies of different, mainly European countries, the presentation will explore the issue with a focus on the ideas of globalisation and sustainability. It will position these examples in a theoretical framework that combines educational debates in the UK with debates on subject-based argumentation in Germany. While in the context of the educational discourse there is a tendency for a renewed emphasis on the importance of subject content and subject boundaries, that is often perceived as contradicting former generic approaches, the debate on argumentation in school subjects starts from a generic point of view, but feels the need to establish specific “subject argumentations” in order to distinguish the efforts to foster this skill in different subjects. The issue of how a subject-based argumentation is defined has hardly been discussed in the educational context, so that the presentation will draw on a more extensive debate that has been conducted outside the field of education in a judicial context. In doing so a clearer perception will be reached of what geographical thinking can achieve; where its limits are and how to deal with these limitations in the sense of a fluid boundary.
Researching progress and sophistication in geography learning: Taking a critical stance

Michael Solem, AAG
David Lambert, UCL Institute of Education

How do children progress in their knowledge and understanding of geographic and spatial concepts? What are the influences of maps and geospatial technologies in that learning process? Questions of this nature are at the heart of the GeoProgressions project, funded by the U.S. National Science Foundation to build capacity for researching learning progressions in geography.

The GeoProgressions project has organized and prepared teams of researchers to carry out core foundational research on learning progressions for maps, geospatial technology and spatial thinking. To support their efforts, the project published a research handbook that presents examples of learning progressions and research models from math and science education.

This paper is based on the concluding chapter in the handbook, “Researching Progress and Sophistication in Geography Learning: Taking a Critical Stance”, by Michael Solem and David Lambert.

In this paper we will present an argument of the need for learning progressions researchers to adopt a critical stance so as to avoid an undue restriction being placed, inadvertently or not, on how progress and sophistication in geography learning comes to be conceptualized and understood. We advocate for prudence and open dialogue aimed at critically assessing the broader impacts of learning progressions on the future geography curriculum, even though it will be many years before such learning progressions become available. Far from dissuading research on learning progressions, we hope to convince researchers that adopting a critical perspective will only advance the quality and ambition of the future work that is undertaken.

We will begin our paper by reviewing some of the salient philosophical issues on learning that are raised by learning progressions. We next apply this critical perspective to how the U.S. national geography standards (Geography for Life) defines goals for geography teaching and learning with maps, geospatial technology, and spatial thinking. Examples of “lessons learned” from related work in England will also be shared. Our critique considers debates about spatial intelligence that have arisen in the literature on spatial cognition, but we also draw upon other theoretical frameworks of geographic thought to encourage researchers to reflect critically on the assumptions underpinning their future work, and how this form of research might implicate geography teaching and learning, as well as the very process of making the curriculum.
Debating the place of knowledge within geography education: reinstatement, reclamation or recovery?

Graham Butt, Oxford Brookes University

Ron Barnett (2009) argues that education has recently witnessed the creation of an agenda to ‘reinstate, reclaim or recover’ knowledge, following a period in which a retreat from knowledge was experienced in many schools and classrooms. This may appear, at face value, to be somewhat odd – for if education is about anything, it is surely about gaining knowledge and developing thinking? Geography educationists have lately reinvigorated their interest in debating the place of geographical knowledge and thinking in education, stimulated in part by the work of Michael Young. This sits against a backdrop of education in schools where ‘the what of curriculum (has) seemed less important than the how of learning’ (Morgan 2014).

This paper draws upon Young’s work as a ‘sociologist in education’, work that has critiqued the social constructivist and postmodernist views of knowledge that have proved influential amongst the social sciences. His arguments examine the ways in which gaining knowledge has been undermined and marginalised by recent trends in educational theory and policy-making - which have often focussed on aspects of teaching and learning, rather than on the importance of knowledge creation and thinking. Young also challenges the status afforded to acquiring generic skills at the expense of subject and knowledge-based education, such that students can access the ‘powerful knowledge’ they would not acquire elsewhere. By exploring Young’s ideas – not least those recently promoted in ‘Knowledge and the Future School’ (2014) – this paper will address one of the key themes of the conference: ‘How teachers can support the development of geographical thinking’.

Through briefly discussing three models of the curriculum devised by Michael Young and Johan Muller – Future 1, Future 2 and Future 3 – this paper will attempt to locate a preferred role for geographical thinking and knowledge creation in schools. The Future 3 model is strongly associated with Young’s ideas of ‘powerful knowledge’, a cornerstone of his vision for the subject-based curriculum with strong links to notions of social justice for all pupils. Young has previously challenged geography educationists to consider whether ‘geography … offers some of the powerful knowledge that we want all young people to acquire’ and has bemoaned geographers’ inability to reference the ‘powerful concepts that geography offers’ (see Butt 2011, p.181). This is highlighted as a potential lack of confidence or, more seriously, a taken for grantedness among geography educators.


Reviewing the power of GIS-based enquiry learning in school geography

Mary Fargher, UCL Institute of Education

This paper provides a critical review of the nature of enquiry learning through GIS, to date and provides a summary of the opportunities and challenges for thinking geographically. Research evidence reflecting the pedagogical benefits of using GIS to enhance school geography continues to grow. Where GIS is being used successfully in schools it is promoting spatial literacy; supplementing fieldwork and enhancing pupils' visualisation of geographical phenomena in increasingly interactive digital environments. In particular, the use of enquiry learning as a conceptual framework has always been closely associated with GIS in schools. The ability to capture and analyse geographical data and display it as meaningful geographical information has led to more pupils in schools decision-making and problem-solving the 'whys-of-where.'

In connection with the conceptual frameworks adopted in the use of GIS in geography education in particular is the idea of applying the concept of ‘geodesign’ and normative modelling in using GIS in the school setting. Geodesign brings together science and design to examine the nature of the interconnections between humans and nature. Its applications are characterised by being cross-disciplinary and aimed at engaging GIS and related technologies in modelling and evaluating impacts on the environment and how to plan for alternative futures. The latter is an approach that continues to feature prominently in GIS use in schools, particularly in geography, science and social science. As map analysis and interpretation is made easier with new spatial technologies, more subjects have embraced the potential of learning through spatial science enquiry. The paper concludes with recommendations for applying the concept of ‘geodesign’ to teaching school geography.
Students’ reflective thinking in geography lessons

Nina Brendel, University of Münster

Reflecting on geographical issues and processes is an essential part of geographical thinking, especially when dealing with complex topics of global learning like sustainability or globalization. However, to distinguish and measure students’ reflective thinking is often a challenge for educators in geography class. In order to provide teachers with a tool to recognize and foster students’ reflection, our study aims to distinguish levels of reflective thinking amongst students and determine factors that foster or decrease student reflection in geography class. Therefore, we asked students of 5 geography classes (grade 10, German secondary schools) to reflect on their geography lessons. Over a time period of 4 to 8 weeks all 94 students wrote a personal weblog and commented on their peers’ weblogs. By using weblogs as a digital learning diary, we intend to foster reflection and collaboration among the students (DABBAGH, KITSANTAS 2011). Based on the theory of the reflective practitioner (introduced by SCHÖN 1983), teachers were requested to reflect on their actions in a private weblog. Additionally, we conducted semi-structured qualitative interviews with teachers prior to the project to gain an insight into their perception of learning and teaching.

In a qualitative content analysis (MAYRING 2010) we then assigned levels of reflective thinking to students’ written reflections using the reflection model of BAIN et al. (1999). In order to determine factors that influence reflective thinking, the teachers’ interviews and blogs as well as the written project evaluations were coded with qualitative data analysis software.

First findings indicate that students obtained a higher level of reflection, when topics of physical geography were linked to perspectives of human geography and when multiple levels of scale were addressed. Furthermore, documentation of individual behavior and discussion of its local and global consequences increased reflective thinking. Constructivist learning settings and being responsible for their own learning was also found to improve the students’ reflection. However, there seems to be no interrelation between the teachers’ level of reflexivity and their students’ reflective thinking.

Merging all findings, we wish to provide a practical model of students’ reflective thinking in geography lessons and suggest methods and strategies for educators to foster reflective thinking in the context of geographic education.


Earth science is dabbles in multi spatial and temporal scale variation of the basic process of earth and its interactions. It is indispensable in the development of students’ geographical thinking. However, Earth Science education is weak in middle school geography curriculum of Mainland China now. A recommendation of Bringing Fundamentals of Earth Science into Middle School Geography Curriculum was submitted to the central leaders by several geo-science academicians of CAS and experts in March 2013. The object of this feasibility research is to reveal the current situation of earth science education in Mainland China and show the urgency of bringing fundamentals of Earth Science courses into middle school geography curriculum of Mainland China and offer some advices at last. Through the methods of questionnaire, international comparison, curriculum evolution research and meeting argument, we get the conclusions that the education of Earth Science is weak in Mainland China; compared with developed countries or regions, the level of Earth Science education in Mainland China is lower; the content of Earth Science was reduced gradually among all previous curriculum reforms of PRC and it is necessary to strengthen Earth Science education in secondary education. Finally, we suggest that compiling the textbook nationwide in junior high school; reconstitution the structure of geography curriculum in senior high school; highlight the application of Earth Science and also some other suggestions, such as strengthen teachers’ training, explore Earth Science curriculum resources comprehensively and establish the teaching environment for Earth Science.
“Geographic education for sustainability: Developing a binational geographical thinking curriculum”

Fabián Araya Palacios and Ximena Cortés Quezada Universidad de La Serena
Alex Oberle and Mollie Ullestad University of Northern Iowa

Background: according to Peter Jackson, thinking geographically is a uniquely powerful way of seeing the world. While it does not provide a blueprint...thinking geographically does provide a language, a set of concepts and ideas, that can help us see the connections between places and scales that others frequently miss. That is the power of thinking geographically¹. In this project thinking geographically, using the big ideas to organise the information, enables children and young people to develop an understanding of: Interdependence: crucially, linking the physical world and human environments and understanding the concept of sustainable development. According to the US Environmental Protection Agency, (EPA 2014²) while various aspects of sustainability have been adopted by schools and universities, businesses, organizations, and governments, there is a need for more standards, based curricular material that connects directly with sustainability and Geographical Thinking.

Relevance: this project demonstrates the link between sustainability, geography and Geographical Thinking by developing a total of sixteen standards-based lesson plans that focus on some aspect of sustainability and interdependence. Unique to this endeavor is that it is a bi-national effort between Chile and the US, thus recognizing the key international importance of sustainability and the need to connect local issues, events, and problems with the larger global context and with similar occurrences elsewhere in the world (this is an important outcome in geographical thinking issues).

Focus: the aim of study was research, investigate, gather information on field jobs, interpret, analyze, and develop educational resources (lesson plans and classroom activities designed to work with digital media) to address local and global problems related to geographical sustainability and geographical thinking issues (specifically interdependence and scale).

Research and Project Development: The original idea for this project grew out of existing collaboration between geography education scholars at the University of La Serena (Chile) and the University of Northern Iowa (US) in 2013. The project team identified eight aspects of sustainability that are common to both the state of Iowa and the Chilean region of Coquimbo, (linked to geographical thinking) as well as being widely transferable to other parts of the globe.

Findings: participated in the project 28 students of eighth level. All of them from the Careero Education in History and Geography. Similarly at UNI, two advanced pre-service geography/social science teachers worked independently to create lesson plans for the eight topics. Following the lead of their Chilean counterparts, the teacher education students created both a webquest and a lesson plan, with the webquest addressing the broader issue and the lesson plan presenting the larger sustainability issue in a statewide (Iowa) context.

¹ Peter Jackson, Professor of Human Geography. www.geography.org.uk/adifferentview

Conceptualising GeoCapabilities and appreciating of the power of thinking geographically

David Lambert, UCL Institute of Education
Michael Solem, AAG

Who are the children we teach? What role does education play in preparing them for this day and age (and their futures)? As geography teachers, how are we able to contribute to their education?

These are some of the key questions that underlie the GeoCapabilities project (funded by Comenius 2013-2016: www.geocapabilities.org). The capabilities approach (derived from Amartya Sen and Martha Nussbaum) is linked directly to curriculum debates concerning specialist knowledge, introducing and developing Basil Bernstein’s ideas of pedagogic rights and Michael Young’s notion of ‘powerful knowledge’ (introduced in detail in Young et al 2014). One important outcome of the GeoCapabilities project will be the means to communicate effectively the value of teachers’ work, particularly in terms of how the development of geographical knowledge and understanding contributes to the educated person.

In summary, the geo-capabilities approach argues that the ‘powerful knowledge’ offered by geography education consists of a deep descriptive ‘world knowledge’; a theoretically informed relational understanding of people and places in the world; and a propensity and disposition to think about alternative social, economic and environmental futures (Solem, Lambert, Tani, 2013; Lambert, Solem and Tani, Forthcoming). Although geography does not tell us how to live, thinking geographically and developing our innate geographical imaginations can provide the intellectual means for visioning ourselves on planet earth.

Thus, GeoCapabilities asks teachers to consider the role of geography in helping young people reach their full human potential. We argue that the capabilities approach expands and deepens the conceptual language of teaching and curriculum in secondary schools, as it helps connect a progressive form of discipline-oriented teaching to broad and ambitious educational aims. It does this through the dialogic space offered by an approach to teachers’ work we call curriculum making (e.g. Lambert and Biddulph 2014).

The presentation will provide a rationale for adopting a capabilities approach to geography in schools. We will outline the main goals of the project, to create a teacher training online platform, which we hope will have international resonance. Finally, the paper will critically reprise some of the literature-based and empirical research undertaken by the project partners to underpin the platform design.

In delivering this paper we hope to provoke questions and critical review of the project at approximately its half-way point.
Supporting geographical thinking in the classroom – the teacher and curriculum control

David Mitchell, UCL Institute of Education.

This paper reports the initial findings of doctoral research asking: How is the geography curriculum made? The research explores curriculum control and the teacher’s role in curriculum making. The context is England at a time of high accountability and performativity in schooling following decades of national curriculum policy. This threatens to draw teachers’ attention away from subject (geographical) thinking. It is a time of change with a new national curriculum from September 2014 and a ‘knowledge turn’ in educational discourse.

The research focus is teachers as they enact the curriculum locally. Four case studies of geography departments teaching KS3 geography (age 11-14) in London secondary schools provide data. An historical account of literature in the field of curriculum studies enables a thematic framework which guides the research. Huckle’s (1985) theory of geography curriculum as both reflecting and transforming society, and Lambert and Morgan’s (2010) curriculum making model are key perspectives informing the research. At the empirical stage, an inductive and iterative process is used to develop codes. Content analysis then allows the presentation of research findings.

The paper contributes to the conference key theme: How teachers can support the development of geographical thinking. Through empirical findings, the paper argues that the strength of geographical thinking in the enacted curriculum is dependent on a web of relationships. There are some grounds for optimism for the development of geographical thinking. Strong personal subject identities thrive in environments of trust, community and communication. In such environments, the development of geographical thought is valued and supported. However, the research also shows a significant, controlling influence of accountability and performativity, which threatens to undermine the integrity of geographical thinking in the curriculum in environments which are less favourable.

The research also shows an intensity of communication in curriculum making. The internet, social media, email and learning platforms show technology now embedded in teachers’ curriculum work, speeding the transfer of information and ideas. Relationships (with pupils, teachers, school managers, university geographers, friends and acquaintances) are important. Attention to ‘enjoyment’ is a prominent teaching principle. An overarching theme emerges of intensified communication in inter-personal and individual-society relationships. This leads to the paper offering a tentative theory of ‘hyper-socialised’ curriculum making in 2014.


Geographic thinking

Sarah Bednarz, Texas A&M University

The purpose of this paper is to unpack and explore the differences among three types of thinking key to geography today: geographic thinking, spatial thinking, and geospatial thinking. Spatial thinking can be defined as a constructive combination of cognitive skills comprised of knowing concepts of space, using tools of representation, and applying processes of reasoning. Geospatial thinking is a specialized form of spatial thinking that engages higher order cognitive processes to reason about phenomena at geographic scales. It is often associated with geospatial technologies (GST). Geographic thinking, in contrast, is a term frequently used by geographers but one without an agreed-upon definition. By comparing and contrasting the origins and uses of these three cognitive processes, the unique qualities of geographic thinking may emerge.

Spatial thinking allows people to use space to model the world (real and theoretical), structure problems, find answers, and express and communicate solutions. The inclusion of concepts of space makes spatial thinking unique from other types of thinking. Concepts of space like location, dimensionality, pattern, and spatial association are declarative forms of knowledge, the building blocks for spatial thinking. Tools of representation such as maps, images, and models support spatial thinking by describing, explaining, and communicating information about objects and their associated spatial characteristics. Spatial thinking often requires complex reasoning, the capacity of individuals to think, make sense of the world, and understand. Processes of reasoning are crucial for learning as individuals obtain, change, or justify practices, institutions and beliefs and range from simple, lower-level thinking such as recognizing, defining, and listing, to higher levels of cognition, such as evaluating, synthesizing, and generalizing.

Geospatial thinking is an application of spatial thinking in the context of using GST. The relationship between GST and thinking processes is assumed to be reciprocal: using GST influence and mediate how people think about the world (Uttal 2000; 2005) and geospatial thinking facilitates the use of GST. How this works is yet unknown but a detailed research agenda in this arena has been proposed (Baker et al. 2014).

Geographic thinking, in contrast, while similar to spatial and geospatial thinking, is unique. But what is it precisely? What knowledge, skills, and practices constitute thinking geographically? And how can knowing this help educators to develop meaningful learning experiences for students?
Thinking Geographically about the developing world in post-development societies

Alex Standish, UCL Institute of Education

Thinking geographically entails the employment of disciplinary concepts (space, place, region, environment) through which to view our object of study: the surface of the Earth. Development is an idea that has been utilised in geography for comprehending countries in transition from lower to higher standards of living. While development thinking evidently reflects Western ideals, in geography education it has provided a conceptual framework for comparison across countries and to evaluate temporal progress, leading to improved knowledge of spatial distribution, regions and place. Yet, Pieterse (2010) notes that in the West today development theory is ‘in crisis’, giving rise to post-development and anti-development thinking. Meanwhile, over the past two decades developing countries have experienced rapid change in their economies, health care, education, cities, demographics and standard of living as poverty rates have declined (Collier, 2008; Sumner 2010). With growing numbers achieving a middle class lifestyle similar to that in the developed world this raises questions about the perceived line between developed and developing countries. This session will utilise Marxist theory to explore the tension between the crisis of development theory in the West and rapid change in the developing world. In order to better capture transitions, practices and aspirations in developing countries do we need to re-evaluate development models currently in use or do we need a more fundamental rethink of what development means? Can we have one model of development when the West is less equipped to play a leadership role or have we entered a world of multiple development paths? This discussion-paper will compare examples of development models and ideas in the curriculum with contemporary literature documenting change in the developing world.


Geography in England’s primary pre-service teacher education: challenges and possibilities

Simon Catling, Oxford Brookes University

This review, drawing on published and unpublished sources, critiques the opportunities to develop 'geographical thought' in non-specialist trainee primary teachers during their initial teacher education courses. Geography is a subject in England’s primary curriculum and a minor element in primary initial teacher education. England’s Teachers’ Standards expect primary teachers to be knowledgeable about what they teach, though there is little time in courses to develop trainees’ geographical knowledge, understanding or thinking. Evidence suggests that: time allocated to geography in pre-service courses has decreased in recent years; up to half of student teachers have no school-based geography qualification; for many their subject knowledge is weak; and observing and teaching good geography in schools is limited. Given the role which primary teachers have in fostering younger pupils’ geographical thinking, there is real concern about the opportunities to develop trainee primary teachers own geographical understanding. The growth of school-based primary teacher education is likely to reinforce this situation, given limited visible and little high quality geography teaching in very many primary schools. The highly constrained time on initial courses inhibits their power to develop trainees’ geographical thought, which contrasts with the introduction in 2014 of a revised national curriculum in England stressing the importance of teaching geographical knowledge, an element in geographical thinking. This is compounded during teachers’ careers by the limited access they have to professional development in geography, through organisations such as the Geographical Association and the Royal Geographical Society. A key challenge is what is important to introduce trainee teachers to and for them to take from the geography components in their initial courses. A way forward is to address trainees’ geographical thinking through connections to the breadth of their ‘everyday geographies’. This involves developing a sense and appreciation of geographical thought, aspects of knowledge which support this, their understanding of effective approaches to developing younger pupils’ geographical thinking, and awareness of their own development needs and ways to address these. To enable this, there need to be consistent opportunities for and positive attitudes to teachers’ career development, as teachers of geography as much as of other subjects in the primary curriculum. Developing primary teachers’ geographical thinking has funding and professional implications.
# Delegates

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<td>David Örbring</td>
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<td>Fabian Araya Palacios</td>
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<td>Iris Pauw</td>
<td>Vrije Universiteit Amsterdam</td>
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<td>Margaret Roberts</td>
<td>Formerly of University of Sheffield</td>
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<td>Víctor Salinas Silva</td>
<td>Instituto de Geografía, Pontificia Universidad</td>
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<td>Católica de Valparaíso, Chile</td>
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<td>Tricia Seow</td>
<td>National Institute of Education, Singapore</td>
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<td>Lizhi Shi</td>
<td>Geography Teaching Society of China/School of</td>
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<td>Geographic Sciences, East China Normal University</td>
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<td>Michael Solem</td>
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<td>Alex Standish</td>
<td>UCL Institute of Education</td>
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<td>Emma Till</td>
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<td>Anke Uhlenwinkel</td>
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<td>Joop Van der Schee</td>
<td>Utrecht University NL</td>
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<td>Nicola Walshe</td>
<td>University of Cambridge</td>
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Fieldtrip: Regents Canal Boat Trip and Kings Cross Redevelopment Project

8.20am   Leave the foyer at 20 Bedford Way, UCL Institute of Education and walk to Russell Square Underground Station

8.45 am   Underground to Camden Town (train ticket provided)

9.20 am   Walk to Walkers Quay, Camden Lock

http://www.walkersquay.com/jennywren.html

10.00am  Jenny Wren http://www.walkersquay.com/jennywren.html

Boat leaves Camden for Regents Park, London Zoo, Little Venice and Kings Cross Granary Square (with commentary)

11.00am  Disembark Kings Cross/Free Time in Granary Square

11.30am  Kings Cross Visitors Centre – An introduction to the redevelopment project

http://www.kingscross.co.uk/visitor-centre

12.00 – Blue badge guided tour of the redevelopment

1.30pm
1.30pm  Walk to Camino tapas restaurant

1.45 – 3pm  Tapas lunch (Set menu included)

http://www.camino.uk.com/restaurants/kings-cross/

3pm  Conference officially ends