Introduction

The 2024 EUROGEO Annual Meeting and Conference is organized in June 2024 in Porto, Portugal, to present outcomes of geographical or interdisciplinary research related to the theme: "Compromised geography: spreading a new world".

This Conference comprised 112 particpants: 2 keynote plenary sessions, 69 paper presentations, 13 posters, 4 workshops, one special session and one field trip. There will be also to opcional short visits.

Conference attendees represent countries from almost all continents.

Participants of the Conference, Porto 2024

Geography contains knowledge, provides skills and generates unique opportunities that allow us to understand the meaning of, and intervene in, the changes occurring in the world.

The consolidation of territorial dynamics originating in the past or the "shrinking" of times and spaces associated with technological innovations impose new responsibilities on the research, training and professional practice of the geographer.

It is about this '**Compromised Geography**' with the vertigo of the world's recomposition, on different scales of analysis, whether environmental, geopolitical, social, economic or, among others, educational, that we challenge you to come to FLUP – Porto, Portugal – to share methods, processes and experiences that allow geographers to streamline procedures.

Conference Strands:

- What is the importance of the Noosphere in the dissemination of geographic knowledge?

- What options for a (more) intelligible and effective geographical discourse?

- What are the implications of AI in the evolution of geographic methodologies?

- How to promote a (less) committed geographical research?

- What's the organization of a new deglobalized world?

Basic Data and Venue

The Conference will be held in the Main Building of the "Faculdade de Letras da Universidade do Porto " - FLUP (click here to see the building)
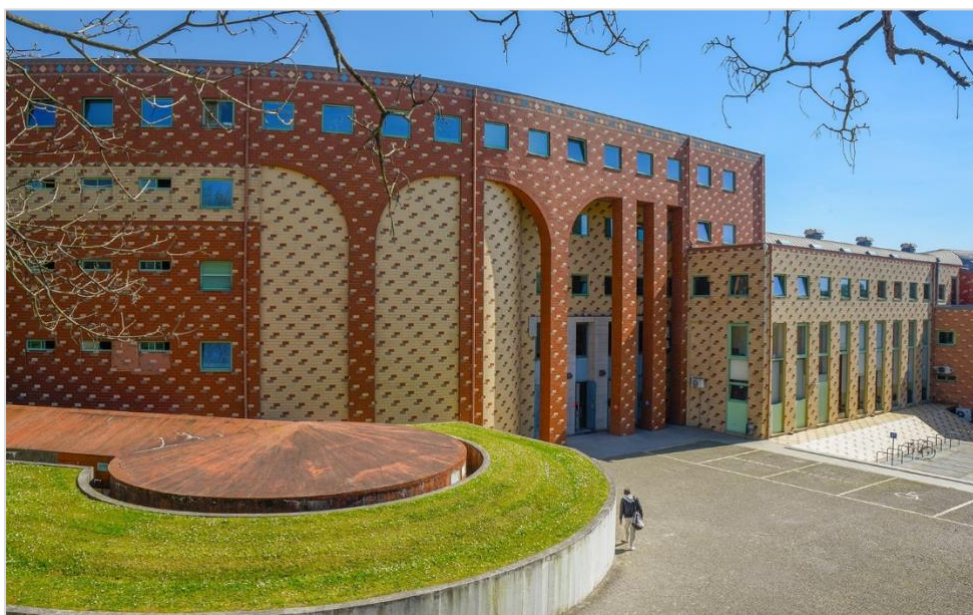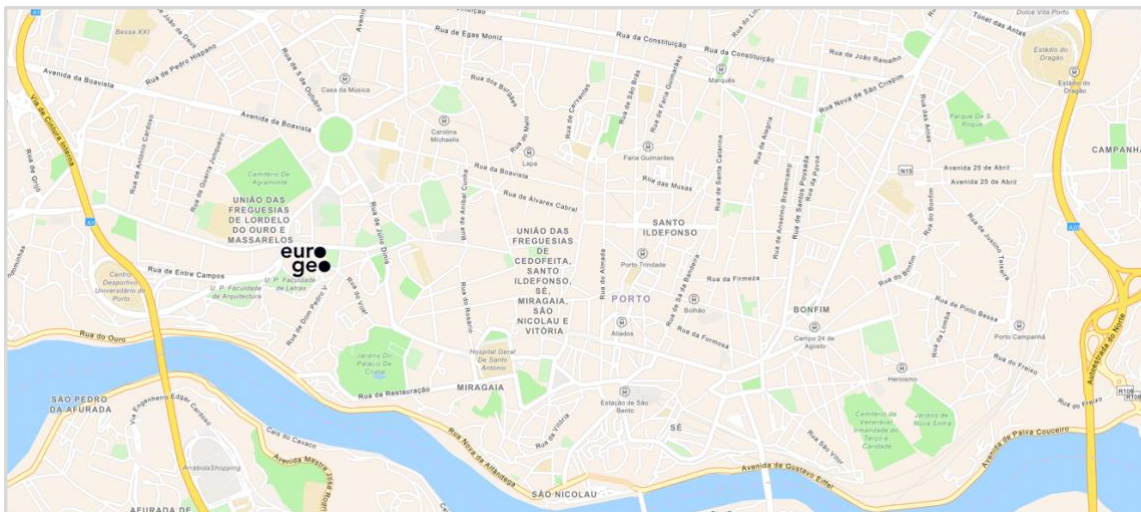
Address:

Via Panorâmica, s/n

4150-564 Porto, Portugal

GPS Coordinates:

41,153915   -8,622301

41°9'3,9"   -8°37'57,2"

https://maps.app.goo.gl/3pT1pbSxWDR9tHR6A

Scientific and Organising Committees

Co-chairs of the Scientific Committee:

Rafael de Miguel González, President of EUROGEO and Professor at University of Zaragoza, Spain

Elsa Pacheco, Professor of Faculty of Arts and Humanities of University of Porto. Geography Department. Centre for Transdisciplinary and Research Culture, Space and Memory. Portugal

Members of the Scientific Committee:

Gabriela Narcizo de Lima, Professor of Faculty of Arts and Humanities of University of Porto (FLUP). Geography Department. Portugal

Helena Madureira, Professor of Faculty of Arts and Humanities of University of Porto (FLUP). Geography Department. Portugal

José Ramiro Pimenta, Professor of Faculty of Arts and Humanities of University of Porto. Geography Department. Portugal

Luís Miguel Inêz Soares. Vice-president of the Board of the Geography Teachers' Association, Portugal

Maria Madalena Pires da Fonseca, Professor of Faculty of Arts and Humanities of University of Porto (FLUP). Geography Department. Portugal

Mário Gonçalves Fernandes Professor of Faculty of Arts and Humanities of University of Porto (FLUP). Geography Department. Portugal

Susana da Silva Pereira, Professor of Faculty of Arts and Humanities of University of Porto (FLUP). Geography Department. Portugal

Caroline Leininger-Frézal, Université Paris Cité, France

Aiketerini Klonari, University of the Aegean, Greece

María Luisa de Lázaro Torres, Universidad Nacional de Educación a Distancia (UNED), Spain

Tjiana Illic, University of Nova Gorica, Slovenia

Karl Donert, National Teaching Fellow, UK

Kostis Koutsopoulos, National Technical University of Athens, Greece

Gerry O'Reilly, Dublin City University, Ireland

Daniela Schmeinck, Universität zu Köln, Germany

Luc Zwartjes, Ghent University, Belgium

Chairs of the Organising Committee

Fátima Matos, University of Porto (FLUP). Geography Department Centre of Studies in Geography and Spatial Planning (CEGOT). Portugal.

Members of the Organising Committee:

Ana Cristina Câmara, President of the Board of the Geography Teachers' Association, Portugal

António Alberto Gomes, University of Porto. Portugal

João Carlos Garcia, University of Porto. Portugal

Laura Soares, University of Porto. Portugal

José Alves Teixeira, University of Porto. Portugal

Miguel Saraiva, University of Porto. Portugal

For EUROGEO:

Rafael de Miguel González, President

Karl Donert, Vice President and Past President

Harry Rogge, Vice President

Michaela Lindner-Fally, Vice President

Gert Rupert, Vice President

Tjiana Ilic, Vice President

Gerry O'Reilly, Vice President

Daniela Schmeinck, Vice President

Kostis Koutsopoulos, Vice President

Caroline Leininger-Frézal, VicePresident

Aikaterina Klonari, VicePresident

Luc Zwartjes, VicePresident / Treasurer

María Luisa de Lázaro Torres, Secretary General

Conference Schedule

Time table	Thursday 30th May
08:30-17.30	**Registration**
9:30-10:00	**Welcome ceremony** (Main Auditorium)
10:00-11:00	**First keynote**: "How Generative AI is Changing Our World" by Prof. Dr. *Nico Van de Weghe*, Ghent University, Belgium. Presenter: Luc Zwartjes
11:00-11:30	Coffee break
11:30-13:00	**Parallel session 1**
13:00-14:00	Lunch
14:00-15:30	**Parallel session 2**
15:30-16:30	**Workshops 1 and 2**
16:30-17:00	Coffee break / **poster exhibition**
17:00-18.30	**EUROGEO Annual General Meeting**
20:00	**EUROGEO Conference dinner** Hotel Ipanema Porto - Rua do Campo Alegre 156 (5 minutes walking distance)

Time table	Friday 31th May
9:00-10:00	**Second keynote: "**Local geography and the irreplaceable virtue of the direct and live", by Prof. Dr. *Miguel Bandeira*, University of Minho, Portugal Presenter: Fátima Matos
10:00-11:30	**Parallel session 3**
11:30-12:00	Coffee break
12:00-13:30	**Parallel session 4**
13:30-14:30	Lunch
14:30-15:30	**Workshops 3 and 4**
15:30-17:00	**EUROGEO projects presentation**
17.00-17.15	**Closing ceremony**

Time table	Saturday 1st June
7:45-21.00	**Field trip:** *Douro valley, landscape, and world heritage*
10.00-13.00	**Short study visit A:** *Exploring Porto: water and landscape* – Prof. Dr. José Teixeira
09.30-13.00	**Short study visit B:** *Porto: from the medieval city to the world heritage* – Prof. Dr. Jorge R. Pinto

(Main Auditorium)

How Generative AI is Changing Our World

Prof. Dr. Nico Van de Whege, Ghent University, Belgium

(Presenter: Luc Zwartjes, Ghent University & EUROGEO)

Generative Artificial Intelligence (GenAI) is not limited to just one domain. It encompasses everything from text and data analysis to image, sound, and much more. But what does this mean for us? Perhaps without realizing it, through our daily digital interactions, we contribute to the growth and evolution of GenAI. It goes beyond mere scientific research. Educators, students, businesses, and essentially everyone will experience the impact of GenAI. While this technology has the potential to transform the way we learn, work, and interact, it also underscores the importance of digital literacy to navigate our way consciously and critically through this new digital world. In this presentation, we delve deeper into this fascinating world.

Local geography and the irreplaceable virtue of the direct and live

Porf. Dr. Miguel Bandeira, University of Minho, Portugal

(Presenter: Fátima Matos, University of Porto)

Geography is one of the oldest and most perennial disciplines of knowledge taught and learned in the global education system. It is practically omnipresent in the curriculum of the history of European education. For better or for worse, it has expressed the challenges of our contemporary societies, going beyond the strict training of younger generations or a particular type of scientific knowledge. Geography has been more about common sense than the specificity that nobles the many and most recent scientific disciplinary affirmations. What it has achieved as a "liberal art," a design that has always had difficulty imposing, has faded into epistemological identity. Of course, this is irrelevant outside a corporate framework. Knowledge advances regardless of its regimentation. Whatever meaning it has, or whatever we want to give it, geography has, over time, been a field of civic education.

There is, however, a semantic and operational heritage that needs to be reconstructed and valued, not because it can be a guarantee of professional continuity and identity for geographers, but because of its potential to demonstrate a way of being, above all, in the educational process and decision support. It is necessary to return to reflecting and exercising

a critical spirit, with a philosophical, social, and political scope, as a scientific-pedagogical objective, handling the corporeality of the territory rather than being dazzled by permanent innovation or by all the technological, uncritical, and subservient followings, so often only to justify disciplinary survival. We will discuss the resurgence of locally-based geography, articulated in the perennial mechanism that gives it its raison d'être: scale and orientation. In valuing direct and live interaction, realizing the exploratory vocation and itinerary attitude it contains. Just as sociology doesn't make sense without social intervention, economics without finance, history without archives, there is no geography without being on the ground. Geography teachers are the officiants of democratically recognized geography, those who give it its true raison d'être in the epistemological broth that is boiling today.

Paper presentations in parallel sessions

30th May	Main Auditorium	Amphitheatre A2	Classroom 201	Classroom 202
Session 1 11:30-13:00	Geography education: curriculum Chair: C. Leininger-Frézal	Environment Chair: F. Matos	Spatial thinking: Chair: D. Schmeinck	Geo-AI (1) Chair: M. L. Lázaro
Session 2 14:00-15:30	GIS Chair: K. Donert	Problems and issues in geography education Chair: G. Ruepert	Teaching controversial issues Chair: G. O'Reilly	Geography of Tourism Chair: H. Rogge
15:30-16:30			Workshop 1: The cost of energy transition	Workshop 2: Teachers in outdoor learning
31st May	Main Auditorium	Amphitheatre A2	Classroom 201	Classroom 202
Session 3 10:00-11.30	Geo-AI (2) Chair: A. Klonari	Geography education for sustainable devlopment and climate change Chair: K. Donert	Human Geography Chair: G. Ruepert	Migrations Chair: E. Pacheco
Session 4 12.00-13.30	Urban Geography Chair: R. Vogler	Geography from Portugal Chair: L. Soares	Geography education from Portugal Chair: A.C. Câmara	
15:30-16:30	Workshop 3: Why Europe is a must	Workshop 4: GEO-OBSERVE		
EUROGEO Session 15.30-17.00	EU funded projects presentation Chair: K. Donert	**CLICK HERE FOR A VIRTUAL TOUR INSIDE FLUP**		

Session Geography education: curriculum

Chair: *Caroline Leininger-Frézal*

Authors	Paper title
Alex Standish	How do Teachers Plan for Progression in their Geography Curriculum?
Susan Pike	Geography at Senior Levels in Irish Schools: Research and Practice in Curriculum Change
Uwe Krause	Powerful Knowledge and the Role of Curriculum Contexts on Teachers' Task Setting
Rainer Mehren	The new National Geography Standards in Germany
Danuta Piróg	Which skills are the most prized? Analysing monetary value of geographers' skills on the labour market

Session Environment

Chair: *Fátima Matos*

Authors	Paper title
Tamar Khardziani	Riparian Landscapes in Drylands of Georgia: Temporal Changes, Current Conditions and Future Trajectories
Aleksandra Jezierska-Thole, Marta Gwiazdzinska-Goraj, Stanislaw Jaworski	Renewable energy infrastructure as a challenge and an opportunity for rural areas
Dejana Jakovljević	Water quality of critical endangered watercourses in the Vojvodina Province in Serbia
György Orsós	Symbolic landscape along the Croatian-Hungarian-Serbian tripartite border

Session Spatial thinking

Chair: *Daniela Schmeinck*

Authors	Paper title
María Zúñiga Antón, Carmen Bentué, Rodrigo Crespo, Marcos Rodrigues	Looking my map: eyetracking techniques to improve cartographic design
Marta Gross, Agnieszka Dawidowicz, Marta Czaplicka, Anna Klimach, Marzenna Nowicka	Components of spatial awareness

Authors	Paper title
Nikola Koktavá	What we know about map-work strategies? Systematic review
Margarita Zaleshina, Alexander Zaleshin	Spatial cognition and navigational behavior in humans, animals and artificial intelligence: similarity and difference
Neli Heidari, Knut Schwippert, Sandra Sprenger	Thinking and Speaking Maps – Conceptual and Linguistic Abilities of Secondary Students

Session Geo-AI (1)

Chair: **Maria Luisa de Lázaro**

Authors	Paper title
Javier Álvarez-Otero, Isabel Gómez-Trigueros, Ayar Rodríguez de Castro	The acquisition of critical thinking through AI for the understanding of geographical phenomena in the framework of the 2030 Agenda
Simona Epasto	Artificial Intelligence in Power Dynamics and Warfare: Redefining Global Equilibria and Its Escalating Role in Military Contexts
Maria Luisa de Lázaro	Exploring the Impact of ChatGPT in Higher Education: Unveiling Opportunities and Challenges through an Experimental Approach
Giuseppe Bettoni	Geopolitics and Geostrategy in the Age of Artificial Intelligence: Navigating the New Frontiers

Session Geographical education for sustainable development anc climate change

Chair: **Karl Donert**

Authors	Paper title
Robert Vogler, Sabine Hennig	Digital Geomedia fostering Sustainability through education - Spatially Enabled Learning in the projects u3green and ESD+
Isabel Gómez-Trigueros	Climate change and extreme atmospheric in the classroom of secondary education in spain: perceptions of the students
Mary Fargher	Exploring the Role of Digital Earth Applications in Climate Change Education Through a Powerful Geography Knowledge Lens
Stefana Matović, Suzana Lović, Darko Vuković	Pre-primary education and early childhood development – analysis of european countries with reference to Serbia
Maria Christoforaki, Nausika Kapsala, Manos Skoufoglou Apostolia Galani	Modifying primary school students' ideas about heatwaves in urban design through the "HEATWAVE CITY" online game

Problems and issues in geography education

Chair: *Gert Ruepert*

Authors	Paper title
Ali Demirci	Redefining the Future: The Urgency of Transformative Geography Education for an Ideal Global Society
Mario Imperioso	Metaverse as new spaces for children
Vendula Mašterová, Darina Mísařová	The Concept of Developing Geoinformatics Skills in Teaching at Primary and Secondary Schools
Dmitrii Sidorov	Lockdown Browser and Students' Performance in Online Geography Courses

Session Teaching controversial issues

Chair: *Gerry O'Reilly*

Author	Paper title
Agnieszka Świętek	Young Poles' openness for "meaningful contact" - on the way to Western liberalism or deglobalization?
Aikaterina Klonari	Secondary school students' views on refugees and immigrants
Gerry O'Reilly	Compromised geography: reflections on how teachers are expected to engage students with controversial issues in the classroom
Tal Yaar-Waisel	*Teach Controversial Geopolitics Issues*
Abidemi Aina	Study and analysis of gsm call loss and it's propagational effect on ecological swathes landform pattern in tropical rainforest

Session Geography of Tourism

Chair: *Harry Rogge*

Authors	Paper title
Claudia Faias, *Claudia Seabra,* *Ana Caldeira,* *Maria Batista*	Impacts Analysis – Tourism destination: Azores
Jovana Brankov, *Ana Milanović Pešić,* *Željko Bjeljac*	Traditional Sports and Games and Community Involvement - Preservation, Transmission of Knowledge, and Tourist Promotion
Ana Milanović Pešić, *Jovana Brankov,* *Željko Bjeljac*	The interaction between environmental quality and cultural heritage in Serbia- exploring residents' attitudes
Merab Putkaradze	Determination of tourism priorities in the sustainable development of mountainous Ajara: challenges and perspectives

Session Geo-AI (2)

Chair: *Aikaterina Klonari*

Authors	Paper title
Ivana Vyslúžilová	The impact of artificial intelligence on urban transformation with the blurring of boundaries in smart cities
Amira Mouakher, *Nuno Morgado*	Artificial Intelligence, Geopolitics, and the War in Ukraine: a predictable conflict?
Iuria Betco *Jorge Rocha* *Ana Ribeiro* *David Vale*	Modelling spatial uncertainty in sentiment analysis using xAI methods
Dritan Rustja	GeoAI (Geospatial Artificial Intelligence) and its applications: a case study of Albania

Session GIS

Chair: *Karl Donert*

Authors	Paper title
Gary K. Higgs	Inferential GIS: A Proto-type Application
Federica Bono	Breaking out of the "ivory tower": community experts and student novices in a community-engaged introductory GIS course
Juan Antonio García González	Geography the world today. The contextualisation of where?
Marta Czaplicka, Agnieszka Dawidowicz, Małgorzata Dudzińska, Adam Senetra	Methodology of creating maps of age-friendliness of urban spaces using GIS tools

Session Human Geography

Chair: *Gert Ruepert*

Authors	Paper title
María Zúñiga Antón, Carmen Bentué Martínez, José Antonio Salvador Oliván Nacho Quílez Aznar, Severino Escolano Utrilla	Health map of Spain
Suzana Lović Obradović, Stefana Matović, Gorica Stanojević, Nina Ćurčić	Leveraging geospatial technologies to capture spatial variation between associated factors and cardiovascular mortality
Amram Ofer, Oje Olufunso, Larkin Andrew, Avery Ally, Gebremedhin Assefaw, Duncan Glen Hystad Perry	Smartphone Google Location History: A New Method for Longitudinal Physical Activity and Exposure Assessment Research
Dylan Munson, Marc Jeuland, Rahel Bekele	Household responsiveness to climatic and livelihood shocks: Results from a first-round survey in Ethiopia
Gekić Haris, Bidžan-Gekić Aida	Childcare policies and social sustainability in Bosnia and Herzegovina: A case study of the Canton of Sarajevo

Session Migrations

Chair: *Elsa Pacheco*

Authors	Paper title
Rossen Koroutchev	A new measure of the attractiveness of the countries for a migrant entrepreneurship
Elizabeth Chacko, Marie Price	The militarized and elastic border between the U.S. and Mexico: Experiences of migrants and asylum seekers
Monika Wesołowska, Anita Kulawiak	Urban-rural migration - opportunity or threat for rural areas in Poland
Vesna Lukić	International student migration in a Serbian context: Socio-cultural integration experiences

Session Urban geography

Chair: *Robert Vogler*

Authors	Paper title
Alexandros Bartzokas-Tsiompras	Measuring rapid transit accessibility and equity in migrant communities across 17 European cities
Andreea-Loreta Cercleux, Elena Bogan, Radu Săgeată	Urban art and revival of public spaces. Insights from Romanian cities
Pedro Vaz Serra, Cláudia Seabra	UNESCO Creative Cities in the inland-Centre of Portugal
Ada Wolny - Kucińska, Małgorzata Dudzińska, Agnieszka Dawidowicz, Marta Gross	Innovations in daily commuting - European case study
Nikola Koktavá, Jiří Horák	Ageing in cities - modelling the cities of the future

Session Geography from Portugal

Chair: *Laura Soares*

Authors	Paper title
Teresa Sá Marques, Fátima Matos, Caratina Maia, Diogo Ribeiro, Paulo Conceição, Isabel Breda Vázquez, Isabel Martins, Paula Guerra, João Queirós, María Neto, Pedro Neto	Unworthy housing in Portugal
Andreia Monteiro, Miguel Saraiva, Teresa Sá Marques	The concept of equity and theories of justice applied to issues related to inequalities in transport and mobility
Gabriela Narcizo de Lima, Roberto Ariel Abeldaño Zuñiga, Deysi Ofelmina Jerez-Ramírez	Climate Change and the Increase in Disasters Related to Hydrometeorological and Climatic Events in Mexico
Susana Pereira Pedro Pinto Santos José Luís Zêzere Alexandre Oliveira Tavares Sérgio Cruz Oliveira Ricardo A. C. Garcia	Landslide risk analysis in Portugal: an insight into the municipal level
Hélder Santos, Diogo Ribeiro, Marcelo Torres, Fernando Honório, Catarina Maia, Teresa Sá Marques	Education and territorial development strategies: the case of the Northern Region of Portugal.

Session Geography education from Portugal

Chair: *Ana Cristina Câmara*

Authors	Paper title
Ana Ferreira, Elsa Pacheco, Francisca Teixeira	Integration and multiculturalism: essays on EBS Fontes Pereira de Melo
Elisabet Fiel	eTwinning Projects at School – The Importance of the Noosphere in the Dissemination of Geographic Knowledge
Madalena Fonseca	Geographical Information and Geographical Education: reflexion on the concept of a geographical powerful knowledge
Elsa Pacheco Laura Soares Paulo Lemos	Teachers for what?" - inertia and emergence in portuguese basic education

EUROGEO projects session

Chair: *Karl Donert*

Authors	Paper title
Daniela Schmeinck	Integration of consumer education in primary schools: research findings and implications
Sophie Wilson	Virtual Field Work in the context of Global Change - a Blended Learning Approach for Higher Education
Caroline Leininger-Frézal	Empowering academics to develop a global change curriculum in higher education: challenges and barriers
Luc Zwartjes, Christos Polykretis, Dimitris Alexakis, Karl Donert	GEOLAND: Digital Educational Geoinformatic Methodologies for Monitoring Landscape
Marta Saracho Arnáiz	Geolocation and Bio-Maps to stimulate the teaching of Spanish literature
Rafael de Miguel González Juan Mar Beguería	Teaching the future and learning climate change with ArcGIS Dashboard

Last Name First Name	SESSION
Aina Abidemi	Teaching controversial issues
Alvarez Javier	Geo-AI (1)
Bartzokas Alexandros	Urban geography
Betco Iuria	Geo-AI (2)
Bettoni Giuseppe	Geo-AI (1)
Bono Federica	GIS
Brankov Jovana	Geography of tourism
Cercleux Loreta	Urban geography
Chacko Elizabeth	Migrations
Christoforaki Maria	Geographical education sust. devel. and climate change
Czaplicka Marta	GIS
de Lázaro María Luisa	Geo-AI (1)
de Miguel Rafael	EUROGEO Session
Demirci Ali	Problems and issues in geography education
Epasto Simona	Geo-AI (1)
Faias Claudia	Geography of tourism
Fargher Mary	Geographical education sust. devel. and climate change
Ferreira, Ana	Geography education from Portugal
Fiel Elisabet	Geography education from Portugal
Fonseca Madalena	Geography education from Portugal
Garcia Juan Antonio	GIS
Gómez Isabel	Geographical education sust. devel. and climate change
Gross Marta	Spatial thinking
Haris Gekic	Human geography
Heidari Neli	Spatial thinking
Higgs Gary	GIS
Jakovljević Dejana	Environment
Jezierska Aleksandra	Environment
Khardziani Tamar	Environment
Klonari Aiketerina	Teaching controversial issues
Koktava Nikola	Spatial thinking
Koktava Nikola	Urban geography
Koroutchev Rossen	Migrations
Krause Uwe	Geography education: curriculum
Imperioso Mario	Problems and issues in geography education
Leininger Caroline	EUROGEO Session
Lovic Suzana	Human geography
Lukic Vesna	Migrations
Marques Teresa	Geography from Portugal
Masterová Vendula	Problems and issues in geography education
Matovic Stefana	Geographical education sust. devel. and climate change
Mehren Rainer	Geography education: curriculum
Milanovic Ana	Geography of tourism
Monteiro Andreia	Geography from Portugal
Mouaker Amira	Geo-AI (2)
Munson Dylan	Human geography

Narcizo Gabriela	Geography from Portugal
O'Reilly Gerry	Teaching controversial issues
Ofer Amram	Human geography
Orsós György	Environment
Pacheco Elsa	Geography education from Portugal
Pike Susan	Geography education: curriculum
Piróg Danuta	Geography education: curriculum
Pereira Susana	Geography from Portugal
Putkaradze Merab	Geography of tourism
Rustja Dritan	Geo-AI (2)
Santos Hélder	Geography from Portugal
Saracho Marta	EUROGEO Session
Schmeinck Daniela	EUROGEO Session
Sidorov Dmitrii	Problems and issues in geography education
Standish Alex	Geography education: curriculum
Świętek Agnieszka	Teaching controversial issues
Vaz Pedro	Urban geography
Vogler Robert	Geographical education sust. devel. and climate change
Vysluzilova Ivana	Geo-AI (2)
Wesołowska Monika	Migrations
Wilson Sophie	EUROGEO Session
Yaar-Waisel Tal	Teaching controversial issues
Wolny Ada	Urban geography
Zaleshina Margarita	Spatial thinking
Zuñiga Maria	Spatial thinking
Zuñiga Maria	Human geography
Zwartjes Luc	EUROGEO Session

Paper abstracts

Session Geography education: curriculum

How do Teachers Plan for Progression in their Geography Curriculum?

Alex Standish

Over the past two decades the geography education community has been on a journey to better understand the curriculum and its relationship to knowledge and skills, culminating in the recent publication of the GA Framework for the School Geography Curriculum (2022). To explore how teachers are making use of this curriculum expertise I analyse how seven secondary teachers are planning for progression in their schools. The teachers are from different parts of England and all participants in the UCL Fawcett Fellowship scheme. Teachers planned for progression in geographical thinking, geographical skills and methods, and application of knowledge, with a view to inspiring curiosity and wonder in the other places and cultures, developing understanding of change and interconnections, and becoming confident in their own voice and listening to the voices of others. Curriculum implementation was achieved through interweaving conceptual knowledge and themes (e.g. weather and climate, geomorphology, development, ecosystems), interweaving studies of places and regions at different scales, planning opportunities for the development of skills of geographical enquiry, and planning opportunities for the application of knowledge to social and political issues. The four strands are not exclusive, and each department has planned a unique curriculum journey that interweaves these elements to achieve their vision of a model geography student. They also plan regular opportunities to obtain feedback and evaluate their curriculum.

Geography at Senior Levels in Irish Schools: Research and Practice in Curriculum Change

Susan Pike

Geography is currently a school subject, and named as such for students from ages 5 in Irish schools. However, students taking geography at the senior end of second level schools in Ireland follow the 2003 Leaving Certificate Syllabus, written 5-7 years before they were born (DES, 2003). This syllabus is currently under review, with a newly named and conceptualised Leaving Certificate Cycle commencing in schools in September 2026. At this time of curriculum change in Ireland, this paper features aspects of curriculum, teaching and learning in schools. Firstly, it outlines the process of curriculum change at the senior end of compulsory education, known as the, in Ireland (NCCA, 2024). Secondly, it outlines initial findings from a Republic of Ireland survey on experiences, practices and attitudes of teachers of geography in Irish second level schools. Finally, it offers the opportunity for

others involved in teacher education to conduct similar studies to create a snap shot of geography in schools across Europe.

References:

Department of Education (DES) (2003) Leaving Certificate Geography. Dublin: DES.

National Council for Curriculum and Assessment (NCCA) (2024) Background Paper to the Leaving Certificate Geography Redevelopment. Dublin: NCCA.

Powerful Knowledge and the Role of Curriculum Contexts on Teachers' Task Setting

Uwe Krause

As the conference programme states, "Geography contains knowledge, provides skills and generates unique opportunities that allow us to understand the meaning of, and intervene in, the changes occurring in the world". Putting this into practice is an enormous challenge for the teacher's role as curriculum maker. In these tasks are a powerful instrument, to ensure that students learn how to deal with complex and abstract knowledge structures, and participate in the geographical discourse, especially when it comes to higher order thinking tasks. However, curriculum contexts can support or challenge teachers' professionalism. During this presentation we will explore the task setting of Dutch and German teachers in upper secondary education and how it is affected by their curriculum contexts.

The new National Geography Standards in Germany

Rainer Mehren

The National Geography Standards represent the consensus of the geography education community around what students should know and be able to do by the time they graduate from the 13th grade. In 2024, new standards were published in Germany. In the presentation, the special focal points of the document will be introduced. These are:

- the new key concepts

- the distinction between a factual judgement and a value judgement

- the communicative participation in public discourses

- the strengthening of digital geomedia

- transformative learning

and much more.

Which skills are the most prized? Analysing monetary value of geographers' skills on the labour market

Danuta Piróg

The objective of the presentation is to identify those skills that are actually needed by the labour market and allow geographers to achieve the highest remuneration. For eighteen months I monitored online job postings from six countries addressed to specialists with a geography degree. Online job postings are the most up-to-date and reliable source of data about the salaries employers are willing to offer for specific skills or skillsets. I collected 17,397 advertisements, out of which 7,407 included information about the offered salary. Applying text mining and regression tree (CART) analyses, I identified those skills that significantly differentiate annual salaries. The group of competences that are associated with higher earnings includes mainly highly specialised GIS, statistical and geological skills. Lower salaries were linked to some general skills such as communicating in a native language as well as some specialised skills, but only to those related to teaching and conducting scientific research.

Session Environment

Riparian Landscapes in Drylands of Georgia: Temporal Changes, Current Conditions and Future Trajectories

Tamar Khardziani

Riparian landscapes are transitional zones between aquatic and terrestrial land cover (Martí et al., 2000; Décamps et al., 2009). They are essential areas of biodiversity, as they support critical ecological functions (Kauffman & Pyke, 2001; Lake et al., 2017). Riparian zones play a crucial role in drylands, as for wildlife as the livelihood of people living nearby. Protecting, restoring, and strengthening them can contribute to sustainable development. Geospatial technologies are essential in supporting decision-making and management of riparian landscapes. Therefore, we created riparian zone maps, analyzed multispectral satellite imagery (MSI), detected LULC changes, collected field data, identified drivers, and assessed past and current conditions of riparian landscapes. An exemplary study occurred along the lower course of river Iori in the Kakheti region of Georgia. We used the QField application for collecting field geodata, Sentinel-1 data for DEM, Sentinel-2 data for spectral bands, SNAP for raster classification, QGIS for mapping, analysis, and representation, Soviet time topo maps for digitizing past conditions, and also areal images from the 2000s. Mainly, research focused on forest features, water bodies, fisheries, and extraction sites. The analysis included calculations of vegetation (NDVI), water (NDWI), and moisture (NDMI) indices, LULC classification, and change detection. Besides assessing biophysical features, we reviewed current and past literary sources, policies, and legal documents.

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Renewable energy infrastructure as a challenge and an opportunity for rural areas

Aleksandra Jezierska-Thole, Marta Gwiazdzinska-Goraj, Stanislaw Jaworski

The EU climate and energy package obliging Poland to increase the use of renewable energy sources in the final energy balance to 15% by 2020; 20% by 2030. Given that the implementation of measures in accordance with the energy policy is a difficult and complex process, there is a need to create an evaluation system to determine the degree of compliance of Poland's energy management with its guidelines. Energy will increasingly be supplied by small power plants that produce energy close to where it is consumed and consumed. There is a problem of coordinating energy production with the capacity of the power grid. The advantage of renewable energy assumptions is its dispersion. Locating the infrastructure close to the consumer affects the reduction of transmission losses, has a positive impact on the distribution and storage of energy. The purpose of the study is to analyze the changes in the share of renewable energy (RES) in Poland against the background of the European Union countries in the years 2004 to 2021. How to accelerate the development of renewable energy infrastructure in rural areas? Are there any risks associated with it?

Renewable energy is largely generated in rural areas. Implementing measures in accordance with EU energy policy, Poland will strive to increase the country's energy security, while maintaining the principle of sustainable development. Impact of energy policy on sustainable development improving energy efficiency, increase in security of fuel and energy supply, diversification of the structure of electricity generation, development of the use of renewable energy sources, development of competitive fuel and energy markets, reduction of energy industry's impact on the environment. In 2022, wind and solar power generated a record fifth of the EU's electricity generated, overtaking gas (20%) and coal (16%) assets for the first time. Twenty EU countries achieved their highest-ever share of electricity from solar. The Netherlands led the way, providing 14 percent of its energy through photovoltaic generation. Poland does not differ in the level of renewable energy use from other countries, although it is below the European average. It shows the greatest similarity to its southern neighbors, Slovakia and the Czech Republic. This similarity applies to both long-term and short-term changes. Principal component analysis has shown that from an eighteen-year perspective, Poland fits well into the European dynamics of change in the share of renewable energy in total energy. The dynamics of these changes is stable (explained by the first component in more than 95%) and covers most of the countries studied. Poland, in order to stay in this general European trend, must take a number of specific actions.

Water quality of critical endangered watercourses in the Vojvodina Province in Serbia

Dejana Jakovljević

Water quality in Vojvodina Province is endangered from different sources including agriculture, industry, traffic, landfills, households, as well as accidental pollution. This study aims to present water pollution in the critical endangered watercourses, so called "black points", which belong to the V class according to the official national categorization. These watercourses cannot be used for any purpose. The period of research is from 2013 to 2022 and include following watercourses: Stari Begej (Hetin station), Hydro-system Danube Tisa Danube (Bač station) and Kikindski canal (Novo Miloševo station) Data were collected from Hydrological yearbooks (2013-2022) of Serbian Environmental Protection Agency. Applied methodology for water quality assessment includes Serbian Water Quality Index (SWQI) and Canadian Water Quality Index (CWQI). SWQI provides information about organic pollution, while CWQI analyses inorganic pollution. Beside the overall water quality CWQI provides information about water quality for specific purposes such as drinking water, irrigation, livestock, recreation and aquatic life. This study also aims to address specific parameters which cause pollution. Applying SWQI methodology, results showed poor water quality for Novo Miloševo station in all years and Hetin station in 2016, 2020, 2021 and 2022. However, obtained results based on CWQI calculation showed poor water quality for aquatic life in almost all stations and years with exceptions of Bač station (2015, 2019 and 2021) and Hetin station (2015). Besides that, overall water quality was poor in Hetin station (2018, 2019 and 2022) Novo Miloševo station (2013 and 2022) and Bač station (2018). Increased Cu, Al and decreased O_2 concentrations caused poor overall and water quality for aquatic life, while high Fe, Mn and turbidity values affected drinking water quality. High As values in Novo Miloševo station in 2022 and Zn concentrations in Hetin station in 2018 threatened all aspects of water quality.

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Symbolic landscape along the Croatian-Hungarian-Serbian tripartite border

György Orsós

In the presentation I will show an analysis of the toponyms among the settlements around the Croatian-Hungarian-Serbian tripartite border, where politico-territorial settings changed several times in the course of the last the century. It is therefore worth examining how territorial changes and the fall of socialist regimes have influenced the symbolic landscape. Quantitative analysis showed that the border changes highly influenced the symbolic landscape. The Hungarian toponymic system is more nation-state centric and lacks national pluralism. In contrast, the settlements of the southern Slavic states have a more ethnically, territorially and ideologically pluralistic name system. However, when complemented by qualitative analysis, it can be seen that certain symbolic policies may be a source of conflict in the region. Although Yugoslavia and Hungary used to have significant territorial conflicts in the region, this is no longer evident in the current symbolic landscape. Instead, the memory-political conflicts surrounding the armed conflicts of the dissolution of Yugoslavia emerge. In contrast to the relatively consistent and homogeneous Hungarian toponymies, the South Slavic territories are rather confused, with the Yugoslav, communist name stock, regional and local identity, and, in the case of symbolic politicisation, a newer ethno-national narrative of confrontation, with few but all the more weight.

Session Spatial thinking

Looking my map: eyetracking techniques to improve cartographic design

María Zúñiga Antón, Carmen Bentué, Rodrigo Crespo, Marcos Rodrigues

Cartography is the natural language through which Geography communicates (Montello, 2002). Two main agents can be identified in this process: those who design and produce the map, and those who use it. Cartographic design from a cognitive dimension has been committed since 1952 to taking into account the process of perception of a map by the user in order to provide feedback to the cartographic process and improve the design itself. It has been called Cognitive Cartography and has regained importance in the last decade both in the field of research and professional practice (Caquard, 2015).. This is because the technological development of map media has facilitated the use of online cartography and democratized location technologies: the map user has an increasingly active role, direct interaction can be much greater; however, it remains to be seen whether cognitive systems work equally well in analogue and digital formats.

This project aims to analyze the process of using thematic cartography from the user's experience, in order to improve its design process. The project is based on carrying out an experiment to collect information from questionnaires and eye tracking techniques, which are the set of technologies that allow monitoring and recording through infrared waves the way in which a person looks at a certain scene or image.

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Components of spatial awareness

Marta Gross, Agnieszka Dawidowicz, Marta Czaplicka, Anna Klimach, Marzenna Nowicka

The study of the level of spatial awareness of school-aged children is important and should be carried out according to a comprehensive scale. Therefore, it is necessary to identify all its components.

The main objective of the research was to develop a definition of spatial awareness, which consists of such elements as spatial thinking, spatial orientation, spatial mental rotation, spatial perception, valorization of space, spatial navigation, spatial visualization, spatial mental transformation.

What we know about map-work strategies? Systematic review

Nikola Koktavá

The article aims to create an overview of research that dealt with the identification of map work strategies and thereby find out what has already been ascertained about the strategies, what types of strategies were identified, how these strategies were examined and based on what research materials, and which respondents were tested. The systematic review analyses, in more detail, six empirical research articles aimed at identifying map work strategies. The findings show that primarily eye-tracking testing is used when researching map work strategies, and the methodologies for the division of the map stimuli into areas of interest (AOI) are similar. The analysis of findings offers an overview of individual methods that were used to identify map work strategies. It was shown that, in most cases, researchers used thematic digital maps and a low number of respondents. The value of the study lies in that it collects available information on research that identifies map work strategies, offers an overview of the methods and points out differences between them.

Spatial cognition and navigational behavior in humans, animals and artificial intelligence: similarity and difference

Margarita Zaleshina, Alexander Zaleshin

Spatial cognition and navigation behavior are formed as a result of the interaction of the subject and the surrounding space, taking into account the multiplicity of attractiveness. When learning, when choosing a goal, when exploring a new environment, the subject relies on spatial references. Modern studies of navigation algorithms and tools have a multi-scale thematic scope: from the neural basis of spatial orientation in the living brain to issues of mass migration of populations [1]. This work is devoted to the study of common approaches to spatial orientation in humans, animals and artificial intelligence (AI), based on concepts of "landmarks, routes and geodetic knowledge". A simple robot is often given a fixed path with the ability to avoid obstacles, while animals and humans do not have fixed paths: their routes are formed based on landmarks, directions and gradients of the environment. Advanced modern AI uses approaches borrowed from humans and animals. This applies both to the recognition of objects and extended boundaries, and to the identification of attributive similarities in objects or their composite components in a single localization. Our paper discusses typical algorithms for spatial data recognition and routes building and describe the problems of such algorithms. In particular, we show that when learning both in AI and in nature, there is a problem of "over-training" when a bird accustomed to the same route does not notice new places for foraging, or an artificial neural network begins to detect buildings in the ripples of the ocean. Separate paper sections are devoted to the structuring processes, both at the macro-level (flocks of birds and animals, tourist flows) and at the micro-level (natural and artificial neural networks). As a result, we show that AI skills can be enriched with the usage of spatial cognitive skills of humans and animals. In addition, an application of AI complements the possibilities of spatial perception and navigation of humans and animals, and builds a new level for discoveries and achievements in geography.

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Thinking and Speaking Maps – Conceptual and Linguistic Abilities of Secondary Students

Neli Heidari, Knut Schwippert, Sandra Sprenger

Attaining map skills in geography education includes fostering students' conceptual as well as language-related abilities connected to maps. In particular, there are interrelations of conceptual structures as mental representations are connected to linguistic knowledge (Halliday, 1999; Saeed, 2015). Thus, students' conceptual and linguistic representation of cartographic concepts are important to investigate as these provide insights into subject- and language-related knowledge required when acquiring map skills in geography. However, there is no sound empirical research on the respective field of study (Heidari et al., 2022). In order to gain a better understanding of the interrelations regarding students' cartography-specific language use and cartographic concepts, a qualitative study among ten upper secondary students was carried out. Students were given the task to draw a sketch map of a familiar route in the school area while simultaneously thinking aloud, which was synchronically recorded. A concept-driven coding scheme based on Harwood and Usher (1999) and Neumann (2011) was then developed and qualitatively applied to the think-aloud protocols and sketch maps. Despite the high heterogeneity within the sample, results show that there is a connection between the cartography-specific language use and the cartographic concept appropriately produced on the sketch maps among the participants of the sample. More profound insights into the results will be presented at the conference.

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Session Geo-AI (1)

The acquisition of critical thinking through AI for the understanding of geographical phenomena in the framework of the 2030 Agenda

Javier Álvarez-Otero, Isabel Gómez-Trigueros, Ayar Rodríguez de Castro

Acquiring critical thinking skills is essential to address the complex challenges of our world, especially those related to geography and sustainability in the framework of the 2030 Agenda for Sustainable Development. Artificial intelligence (AI) can play a key role in this process, offering tools and platforms to improve understanding and decision-making. In this paper, we explore how AI can facilitate the acquisition of critical thinking, the improvement of understanding of the SDGs and the proposal of concrete actions in the context of geographical phenomena and the 2030 Agenda. Specifically, we show some didactic potentialities of Chat GPT in the Social Sciences classroom, more particularly in Geography, following the mandate of the 2030 Agenda for the achievement of Goal 16: "Peace, Justice and Strong Institutions", the right of access to information for the entire population; and Goal 4: "Quality Education" among others. Through its implementation in the classroom, the aim is to develop strategies in students based on critical thinking, in terms of accessing and processing information, especially that which comes from information-generating applications through artificial intelligence.

Artificial Intelligence in Power Dynamics and Warfare: Redefining Global Equilibria and Its Escalating Role in Military Contexts

Simona Epasto

The integration of Artificial Intelligence (AI) into global military and geopolitical arenas is catalysing profound shifts in power dynamics, challenging traditional paradigms of warfare and strategic stability. This paper scrutinizes AI's expanding role in military contexts, emphasizing its potential to enhance cyber capabilities and reshape the strategic interactions among nuclear and non-nuclear states. The Israel-Hamas conflict and the escalating technological rivalry between the USA and China serve as pertinent case studies. The latter highlights the strategic competition in AI development and deployment, underscoring the global implications of this race on military balance and international relations. The analysis delves into AI's influence on the acceleration of warfare tempo, the redefinition of deterrence mechanisms, and the heightened risk of unintended escalations in a rapidly evolving battlefield landscape.

A critical examination of the perceptions held by policymakers regarding AI's military applications reveals a complex interplay between technological advancements and strategic considerations. The potential for AI to disrupt the delicate balance of strategic stability—

historically characterized by the absence of incentives for nuclear confrontation—is a focal point of concern. This paper argues for the imperative of a multidisciplinary dialogue that bridges the gap between technological innovation and ethical governance. By fostering collaboration among military strategists, policymakers, technologists, and ethicists, the international community can navigate the dual-use nature of AI, leveraging its benefits while mitigating its risks.

Considering recent geopolitical developments, such as the heightened tensions following Russia's actions in Ukraine and the intensifying US-China technology war, the paper emphasizes the urgent need for adaptive strategies that account for the unpredictable trajectory of AI in warfare. The conclusion advocates for a proactive approach in international policy and norm-setting, aiming to establish a framework that ensures AI's ethical integration into military doctrines and global security architectures. This approach is vital for maintaining strategic stability and preventing the escalation of conflicts in an increasingly AI-dependent world.

Exploring the Impact of ChatGPT in Higher Education: Unveiling Opportunities and Challenges through an Experimental Approach

Maria Luisa de Lázaro Torres

University education should strive to impart literacy in the latest technology, making it accessible to students for the development of research, innovation, and the cultivation of workplace competencies essential in today's job market. This goal must be pursued without compromising critical thinking and analytical skills. Within this framework, ChatGPT (Generative Pre-trained Transformer), developed by OpenAI for conversation and text generation tasks, has emerged. Despite its increasingly widespread use, there has been a lack of parallel legislative development and a rigorous examination of its scope. Through experimentation in the university classroom, this study aims to contribute insights to the ongoing debate surrounding the introduction of this tool and the educational possibilities it presents.

Geopolitics and Geostrategy in the Age of Artificial Intelligence: Navigating the New Frontiers

Giuseppe Bettoni

The arrival of AI represents a further step towards an increasingly antagonistic planetary context and where the most powerful weapon remains "intelligence". We quote the White Paper Chinese defense in a new era: "The war of intelligences constitutes a new form of conflict in which the acquisition of emerging technologies [...] would make it possible to compensate the American military advantage and guarantee victory". (China Ministry of Defence White Paper). Until now the geopolitical framework in new technologies was initially

aimed at the cybersphere and then at those technologies fundamentally linked to the use of the network to intercept communications, information, and possible innovations (Christopher Ankersen, Frederick Douzet, and Scott J. Shackelford (edited by), Cyber Peace: Charting a Path Toward a Sustainable, Stable, and Secure Cyberspace, Cambridge, Cambridge University Press., 2022). It was a lot about being able to destabilize the adversary through cyber-attacks and control as much information as possible. Initially it was a question of defence against attacks by countries trying to rebalance their disadvantaged position (see Russia's hacker network after Yeltsin). Then the arrival of OSINT (Open-Source Intelligence) further changed the balance allowing investigations into ongoing conflicts by exploiting open-source data as we were able to see for the war in Ukraine (Maxime Audinet, Kevin Limonier, De l'enquête au terrain numérique : les apports de l'Osint à l'étude des phénomènes géopolitiques, in Hérodote n°186, pp. 5-17, 2022).This contribution show the common thread of this evolution and what it has meant to highlight both of future research paths and to show the direct correlation between geopolitical analysis method and AI.

Session Geographical education for sustainable development anc climate change

Digital Geomedia fostering Sustainability through education - Spatially Enabled Learning in the projects u3green and ESD+

Robert Vogler, Sabine Hennig

Education for sustainable development (ESD) is one key action in the 21st century, so several new ideas and concepts from formal education (incl. new technologies) can be transferred to ESD activities. One of those is the domain of Learning with Geoinformation (LwGI). While most LwGI approaches argue that geomedia use should be learned to achieve further goals, the Spatially Enabled Learning (SEL) approach assumes that the spatial embedding of learning content itself (via the platform character of digital geomedia) can support the learning process itself.

 SEL conceptually makes use four pillars (geovisualization and dual coding, context through spatial references, digital geomedia and location as an interface, interactivity and minimized ""split attention effect"") and attempts to promote learning by embedding learning content in geomedia. Accordingly, it is about using web-based, digital geomedia to support interaction with, communication about and documentation of learning content dynamically via spatial contextualization. [1].

 The objective of this paper presentation is to deliver the conceptual background of this concept and to illustrate its implementation in the two projects "u3green" [2] researching the meaning of urban green for teenagers based on geomedia survey and analysis technologies and "ESD+" [3] prototyping two ready-to-use ESD modules for informal education based on geomedia. In addition, recent findings of both projects will be presented and discussed.

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Climate change and extreme atmospheric in the classroom of secondary education in spain: perceptions of the students

Isabel Gómez-Trigueros

The current climate emergency context has endowed the topic of climate change in Secondary Education with greater interest, although in general conceptual confusions are generated that must be resolved given the social importance that climate issues have acquired. The objectives of this research, focused on students in the 3rd and 4th year of Secondary Education (13 to 17 years old) in public schools in Alicante (Spain), aim to show the perception of students about climate change and its relationship with the effect greenhouse, depending on the matter in which said contents have been taught; and to analyze if the students of the 3rd year and 4th year of Secondary Education acquire the basic knowledge on the subject at the end of said cycle. To meet these objectives, a non-experimental, descriptive, correlational, survey-based, and cross-sectional study has been developed. The sample is made up of 784 students surveyed during the 2021-2022 academic year. The results show the lack of knowledge about the phenomena of climate change and the greenhouse effect, which are more or less visible depending on the subject in which the students have worked on said subject, although it should also be noted that 32.65% of the sample has not worked. Therefore, the need to address this issue in the Secondary Education courses analyzed is claimed, because this is one of the great challenges that society faces, and for which we must train the student body within the framework of the Agenda 2030 and the Sustainable Development Goals.

Exploring the Role of Digital Earth Applications in Climate Change Education Through a Powerful Geography Knowledge Lens

Mary Fargher

This presentation argues that geography's conceptual tools have a unique part to play in operationalising digital earth applications in climate change education. A case is made that it is only through developing full knowledge and understanding of key concepts of place, space and environment that the potential of digital earth applications for teaching and learning about the complexities of climate change can be fully realised. The presentation begins with a walk through key contemporary climate change digital earth applications, casting a critical eye on their potential and limits for enhancing geographical analysis, explanation and generalisation about climate change on global, regional, local and inter-scalar levels. The presentation then focuses on one application - NOAA's Climate.gov resources to exemplify how applying a powerful geography conceptual framework can help teachers connect geo-visualisation of climate change causes, impacts, management and mitigation to tenets of powerful geography knowledge.

Pre-primary education and early childhood development – analysis of european countries with reference to Serbia

Stefana Matović, Suzana Lović, Darko Vuković

Growing emphasis has been given in recent years, if not decades, to scientific studies on preschool education and early childhood development. The findings demonstrated that these processes, in addition to getting children ready for the anticipated shift from home or kindergarten to school, improve their development. The primary goal of this research is a comparative analysis of early development and preschool education across European countries that have available data. Namely, the analysis of Goal 4 of sustainable development, that is, Target 4.2 within the aforementioned goal, was carried out. Since it was stated that there should be no inequality within these and other targets, a comparative analysis by gender was performed as well. The situation regarding preschool education and early development in Serbia is presented in the second section of the article. This analysis is presented by region, and some parameters are also analyzed by gender. Analysis was also done on Serbia's standing in relation to other countries on the continent. All children are main human resource of our future, so it could be concluded that Serbia is on the good way to use that resource. However, the factors that still require attention have been identified along with the European countries whose actions are setting the standard and should be adopted.

Modifying primary school students' ideas about heatwaves in urban design through the "HEATWAVE CITY" online game

Maria Christoforaki, Nausika Kapsala, Manos Skoufoglou, Apostolia Galani

The escalating frequency and intensity of heatwaves in the urban environment is an alarming reality that requires immediate attention and action (Meehl & Tebaldi, 2004). The climate crisis has induced warming trends in many areas globally, exacerbating challenges within the urban environment notably the swelling of the urban heat islands (Leal Filho, 2019). Consequently, there is therefore an urgent need to integrate the issue of heatwaves in the urban environment into education, fostering empathy among youth, heightening awareness, and preparing them to adequately confront this global challenge. The issue of heatwaves in the urban environment requires a cross-border and holistic approach, considering its impacts on health, the economy and society at large. Urban areas face particularly serious consequences of rising temperatures, creating the need to develop innovative approaches to their protection. However, the dominant technical approaches to this phenomenon do not incorporate economic, social, and political factors, although they are essential for understanding the interactions with the urban infrastructures, the urban heat islands, and the climate crisis (Skoufoglou et al. 2023).

This paper presents the outcomes of the implementation of the online game "HEATWAVE CITY"

(https://360.articulate.com/review/content/48e8c83f-24ea-45d5-89ce-ca49360ad858/review)

 that was developed within the Erasmus KA2+ Project "Heatwaves Awareness Through Online Learning" (HEAT). The game is based on the curriculum created in the framework of the HEAT project (Chatzara et al. 2023), aimed to alter students' perceptions of addressing heatwaves in the urban environment. We critically examine students' initial ideas about how to confront heatwaves in the urban environment (Mavrikaki et al. 2023) and assess the degree to which these ideas can be reshaped through the "HEATWAVE CITY" game.

 The research questions aimed to be answered are the following: a) What are the primary school students' ideas about addressing heatwaves in urban design? b) To what extent can the students' ideas about dealing with heatwaves in the urban environment be modified through the "HEATWAVE CITY" game? To address the above mentioned questions, we developed worksheets to accompany the game. These are based on an inventory focused on teaching about climate change within online education, under the framework of the HEAT project (Koutra-Heliopoulou et al. 2023).

 The first part of the research involves determining students' ideas on addressing heatwaves in the urban environment, through an online questionnaire. The second part entails the practical implementation of the online game alongside the corresponding worksheets designed to align with each stage of the game. The last part of the research involves a follow-up administration of the online questionnaire to ascertain the extent to which the game contributes to modifying students' misconceptions and ideas regarding heatwave management in urban settings.

 Based on the research findings we contend that the proposed game has the potential to modify students' perceptions. By employing the "HEATWAVE CITY" game we foster an interactive learning environment wherein students actively engage in problem-solving, decision-making, and exploration of complex socio-scientific challenges associated with addressing heatwaves in the urban environment. This hands-on approach enabled students to directly interact with the material and observe the consequences of their choices, facilitating a more profound comprehension of the subject matter.

Problems and issues in geography education

Redefining the Future: The Urgency of Transformative Geography Education for an Ideal Global Society

Ali Demirci

Despite outstanding scientific and technological advancements, especially in the last century, the need for a more significant, ideal global society is increasingly urgent in the face of pressing global issues that span social inequality, economic disparities, environmental degradation, and political instability, negatively impacting billions worldwide. While school education, particularly geography education, has been recognized as crucial for this purpose, examining current global issues raises questions about the efficacies of our practices to achieve this purpose. Why do we need an ideal global society? What characteristics should such a society have? Do we genuinely desire a conscious global society, and to what extent can we achieve that? What is the role and potential of geography education in creating such a global community, and what should be done to realize this potential? This presentation critically addresses these questions, emphasizing reevaluation not only in what and how we teach but also in why we teach, promoting a transformative approach that actively contributes to creating productive, active global communities.

Metaverse as new spaces for children

Mario Imperioso

This research aims to demystify the intricate relationship between the metaverse's virtual spaces, such as Fortnite and Minecraft, and their interaction with minors. It focuses on understanding how children and underage users not only navigate and shape these digital landscapes but are also, in turn, molded by them. With these platforms evolving beyond mere gaming to become hubs of socialization and creativity, they play a pivotal role in the developmental trajectory of their young audience.

To address this research query, the study will employ qualitative content analysis and participatory observation methodologies. These approaches will enable a deep dive into the ways underage users engage with, contribute to, and are influenced by the virtual environments of the metaverse. Through examining the social interactions, creative expressions, and behavioral patterns within these platforms, this study intends to uncover the bidirectional influence between minors and their virtual spaces.

The preliminary findings suggest that the metaverse offers a unique playground that merges entertainment with elements of real-world skill development, including social competencies,

creativity, and identity formation. Virtual spaces provide minors with unparalleled opportunities for explorative play, learning, and personal expression. However, this influence is reciprocal; while children actively customize and interact within these environments, these digital realms simultaneously exert a significant impact on their users, shaping perceptions, behaviors, and social norms.

In summary, the research highlights the dynamic exchange between minors and the virtual spaces of the metaverse. By incorporating qualitative content analysis and participatory observation, the study aims to offer insights into navigating the opportunities and challenges posed by digital platforms, emphasizing the need for a balanced approach to leverage their developmental potential while ensuring the safety and well-being of young users.

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The Concept of Developing Geoinformatics Skills in Teaching at Primary and Secondary Schools

Vendula Mašterová, Darina Mísařová

Geospatial technologies are an essential part of a wide range of disciplines. As tools they allow us to solve geographical problems more easily. Moreover, they are gradually being implemented into education at primary and secondary schools. Geospatial technologies help pupils to understand geography more easily and develop map skills, as well as technical skills. We define this fusion of such skills as geoinformation skills (Mísařová et al., 2023). Geoinformation skills include reading, selecting, using, creating, and sharing geospatial data and digital maps. This theory is based on previous works related to map skills (Havelková & Hanus, 2019).

The paper aims to introduce the concept of the development of geoinformation skills at primary and secondary schools. This methodological support for teachers responds to the lack of support for the development of these skills not only in geography education in Czechia as well as abroad. The concept includes a matrix of learning tasks, which are organized according to individual skills and levels. The concept is intended especially for pre-service and in-service teachers of geography at primary and secondary schools, but also for the creators of national and school curriculum or teachers in non-formal education. The methodology provides the teacher with instructions for more effective teaching and presents the possibilities of

inclusion and use of these technologies. An essential part of the methodology is the definition of key terms related to geoinformation technologies (e.g. GIS, remote sensing, GNSS), but also a discussion of the benefits and barriers of geoinformation technologies in teaching and the implementation of geoinformation technologies in curricular documents.

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Lockdown Browser and Students' Performance in Online Geography Courses

Dmitrii Sidorov

Assessment is an important part of teaching, and online testing offers many advantages for classroom management and learning: ease of grading, immediate feedback, robust question types, integration of technology such as graphing utilities or specialized applets, and multimedia integration. The effectiveness of utilization of proctoring technology in improving students' performance in online courses remains a lesser addressed topic.

This paper summarizes my experience of utilizing Lockdown browser for non-proctored testing in asynchronous online courses. Lockdown browser minimizes opportunities for cheating during online test by locking students' access to peripheral resources (e.g., printing, copying, accessing another web-site or application). Additionally, this research project analyzes students' performance in terms of their changing demographics (primarily the level of their seniority).

Session Teaching controversial issues

Young Poles' openness for "meaningful contact" - on the way to Western liberalism or deglobalization?

Agnieszka Świętek

Thirty years ago, it seemed that Poland, like other countries of Central and Eastern Europe that had liberated themselves from communism, would follow a straight path towards Western civilization politically, economically, as well as socially and culturally. The theory of modernization assumed the development of this part of the world as an imitation of the modern liberal-democratic order, filling the civilization gap or taking advantage of a historical (geopolitical?) opportunity to socio-economically catch up with the West. The postmodernity in Western civilization brought liberalization of social life, increased acceptance of pluralism of values and diversity of lifestyles, and a decline in the importance of traditional values in favor of postmodern self-development values and post-materialist priorities. While globalization trends in terms of the increasing role of consumption and the influence of popular culture and media on society in Poland are identical to those occurring in Western European countries, Poles' attitudes towards cultural diversity show more complicated patterns of change. Whether Polish society will culturally follow the path of Western civilization countries will depend mainly on the attitudes of the young generation of Poles, which are the subject of the author's speech.

 The author will present the attitude of Poles towards other nations on the background of the current political and migration situation in Poland. She will also present the methodology and results of her own research on the openness of young Poles to cultural diversity and their determinants, conducted on a group of 1,361 eighteen-year-olds in Poland in 2021. The theoretical framework for the conducted research was the concept of ""geography of encounter"" (Valentine, 2008; Wilson, 2016). The results indicate that the young generation of Poles is more open to "meaningful contact" than their parents, but the strength of the primary socialization process causes that this change occurs very slowly. What remains unchanged are the groups of nations to which Poles, regardless of age, show sympathy or aversion.

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Secondary school students' views on refugees and immigrants

Aikaterina Klonari

Greek schools are mostly multicultural as their student population includes not only native Greeks but also many newcomers, with immigrants & refugees, especially since 2016 on. Geography, as a form of knowledge that helps us in interpreting the world, is able to educate us in an understanding of the socioeconomic processes that occur as well as in the construction of a sense of 'multi-belonging.' In this context and knowing that in Greek geography curricula, the migratory phenomena and the problems associated with them have always been a classic theme, this research aims to investigate secondary school students towards immigrants and refugees. The sample was 50 students (29 girls and 21 boys) from Mytilene, Lesvos Island, Greece. The research tool was a questionnaire with open-ended questions. The results of the research showed that while students have heard about the terms refugee and immigrant, they find it quite difficult to make an accurate definition of these. An important finding is that most Greek students declared that most information about refugees or immigrants is learned from TV news & social media, but that they had unclear ideas about the reasons that forced them to move from their respective countries of origin. Another important finding was that they feel equal to their classmates from another country and would like to help them. There is a positive attitude towards learning a foreign language mainly due to communication. Finally, most students did not want to have a different class from classmates from another country.

Compromised geography: reflections on how teachers are expected to engage students with controversial issues in the classroom

Gerry O'Reilly

Compromised geography suggests negotiated consensual spatial and place living arrangements or organization that are necessary so as to avoid violent or bloody strife, and extremism from the local to wider scales on all sorts of issues. Geography researchers and teachers are expected to present the scientific and factual variables, alongside awareness of the non-material and existential variables, in order to enhance research and to develop balanced perspectives in education. In this context, controversial issues must be dealt with in class in fostering positive individualism, good citizenship, and democratic values in order to combat anomie, and the insidious dangers of populism(s). Due to digital and social media students at all educational levels are exposed to breaking news, soundbites and controversial issues including climate change, wars such as those in Ukraine and Gaza, protests in the streets and in cybersphere. This paper explores the teaching of controversial issues and the realities on the ground in a university in Ireland.

Teach Controversial Geopolitics Issues

Tal Yaar-Waisel

Teachers feel that they are "at risk" when teaching controversial issues. They feel uncomfortable, anxious, and sometimes reluctant to teach geopolitical issues - whether from insufficient knowledge or fear of speaking things in a political context. Teaching political issues encounters difficulties and barriers in various places worldwide (Grayson,2015; O'Reilly,2019). Often, teachers are cautious in their words, so they use different terms simultaneously for the same things, which can present additional challenges to their students (Yaar-Waisel,2021).

For example, teaching borders is a controversial issue. In the era of globalization, the development of technologies for the transfer of information, joint economic interests, and international collaborations on the topics of ecology, refugees and migrant workers, terror, and drugs may facilitate the importance of teaching this subject. The issue arose again when the COVID-19 epidemic brought about the re-closing of borders worldwide, raising border complexity again. Because borders worldwide have been changing their character dramatically over the last decade, teaching the subject has become more complex and requires teachers to teach an uncertain and controversial subject. There is a need for teacher training and teacher guidance for teaching the subject.

Teacher training should be based on recognizing the importance of teaching political subjects and enabling teachers to overcome difficulties in teaching such subjects. Student-teachers should be exposed to the complexity of teaching the subjects during their training period; they should experience teaching through classroom discussions.

It is important to emphasize to teachers the need to educate youth in political thinking, evaluating alternatives, and drawing conclusions. A student in a democratic state must develop the tools for independent thinking and establish positions that can be formulated after learning and understanding reality.

A teaching model is conducted to help teacher-train teachers to teach their students how to teach geopolitics as its concerns and challenges.

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Study and analysis of gsm call loss and it's propagational effect on ecological swathes landform pattern in tropical rainforest

Abidemi Aina

Landforms represent topographical features on the surface of the Earth. Landform Mapping is a concept of the land surface, whose definition and subdivision from Digital Elevation Models (DEMs) have been observed in different regions, due to its effects on the propagation of electromagnetic waves which is important in successful call termination by telecoms. A line of sight propagation is a characteristic of electromagnetic radiation which allows waves travel in a direct path from source to receiver. This implies that electromagnetic waves make cellular calls possible, provided there is no impediments that negates electromagnetic wave propagation to reach its destination (cellphones) with minimum or no signal loss.

In this research we aim to study and analyze GSM call loss and it's propagational effect on ecological swathes landform pattern in tropical rainforest with the following hypotheses: i) There is a significant variation of landform patterns on ecological swathes in the study area, ii) There is strong correlation between the arbitrary signal strength difference of Mobile Phone Base stations and subscribers reception , and iii) There is a significant increase in the number of dead zones and call loss/reception due to landform pattern. Primarily, data gathering of reconnaissance, ground toothing and questionnaire administration methods are employed. Mobile datasets of individual call detail records (CDR) and aggregated call-volume data are collected. The preliminary results show that, a) The study area experienced call drops as a result of poor network coverage, b) The study areas composition of the basement complex rocks of igneous and sedimentary rocks deterred mode of GSM communication in the region, and c) The study affirmed that elevation in the study area affects call quality, clarity and signal strength.

Session Geography of Tourism

Impacts Analysis – Tourism destination: Azores

Claudia Faias, Claudia Seabra, Ana Caldeira, Maria Batista

Purpose. This study is based on the premise that the social impacts of tourism experienced by residents in difficult times can influence their support for tourism development. While the literature refers a series of recent studies on the perception of the tourist impact on residents there is a gap in the way in which the perception of residents in a time of crisis can influence their attitudes towards supporting tourism.

Design/methodology/approach. This work was based on the Analyze of the relations and correlations between the characteristics of the companies and the perception of tourism impacts.

Research limitations/implications. This is a preliminary study. Included micro, small and medium-sized companies in seven of the nine islands of the Azores.

Practical implications. After processing the collected data, it is intended to generate inputs for optimizing the management of tourism impacts and planning the tourist destination. Public and private entities and the Azores community will have information at their disposal that will allow them to create outputs that enhance the perception of quality of life and place attachment to tourists, residents, and stakeholders.

Originality/value. Contribute to the introduction of a sustainable tourism model for the Azores that considers the specificities and needs of residents, tourists, and stakeholders.

Traditional Sports and Games and Community Involvement - Preservation, Transmission of Knowledge, and Tourist Promotion

Jovana Brankov, Ana Milanović Pešić, Željko Bjeljac

After being entered the UNESCO List of intangible heritage, traditional sports and games (TSG) were officially recognized as a significant segment of cultural heritage and local identity (Bjeljac, Brankov & Ćurčić, 2021). In the last few decades, various declarations have highlighted the importance of TSG, as well as the need for their protection and affirmation in a new way to save them from disappearing (UNESCO, 2017). The research analyzes the preliminary results of a project dealing with restoring and preserving TSG through different types of community involvement. A specific part of the project included conducting survey research and organizing a focus group. The survey results confirmed that respondents never played most of TSG and numerous sports and games (more than 60% on the offered list) were entirely unknown to them. The majority of respondents (59%) think that youth are not interested in the preservation of TSG. Only one-third of survey participants (35%) visited an

event that promotes these sports, which urges the need for affirmation of such events and increasing the interest of the community. Over 60% of the respondents support the attitude that traditional sports can be marketed through tourism and vast majority (89%) believe that these sports provide an opportunity for tourists to become familiar with folk traditions and get involved in these games. The survey results pointed out insufficient promotion of TSG through all types of media and the offer of rural, cultural and sports-recreational tourism. Implementation of a focus group, with the participation of experts of various profiles, enabled the creation of the necessary guidelines for the preservation and promotion of TSG. The significance of educating the local communities, as well as children and youth, together with the realization of certain thematic events, primarily in urban areas, were specifically highlighted.

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The interaction between environmental quality and cultural heritage in Serbia- exploring residents' attitudes

Ana Milanović Pešić, Jovana Brankov, Željko Bjeljac

Cultural heritage as attractive sites lead to tourism development. However, tourism and other economic activities can affect the degradation of cultural heritage and environment in its surroundings. Besides official data, at the local level, surveys involving the local population can significantly help to assess the state of the environment and cultural heritage. Survey research that examines the residents' perception is often used in the assessment of tourism impact on natural resources pollution (Milanović Pešić et al, 2023), and on environment and cultural heritage degradation (Agisilaos, 2012). This study aims to examine the residents' attitudes on the interaction between environmental pollution and tangible cultural heritage at the municipality level in Serbia. Preliminary results indicate that a third of respondents (35.9%) believe that the environment near the most significant cultural heritage in their municipality is moderately polluted. Analyzing the pollution level of natural resources, more than a third of respondents believe that surface (39.5%) and underground water (34.9%), soil (37.0%), and air (32.3%) are moderately polluted. An equal number of respondents (23.6%) think that air and surface water are significantly polluted. Air was singled out by the most respondents (10.3%) as a highly polluted natural resource. In addition, half of respondents believe that tangible cultural heritage in their municipality is most threatened by intensive construction in the surrounding area (53.3%). A more detailed analysis in this study includes

the correlation of residents' responses and variables, such as geospatial distribution of respondents, age and sex structure, and education level. The obtained results can serve as additional data on the environment quality at the local level, the residents' perception of the existing and potential sources of environmental pollution, and their impact on tangible cultural heritage. This can serve stakeholders and decision-makers in sustainable cultural heritage management, as well as environmental protection.

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Determination of tourism priorities in the sustainable development of mountainous Ajara: challenges and perspectives

Merab Putkaradze

Sustainable development of mountainous regions and their social and economic growth is one of the significant challenges of modernity. The mentioned problem constitutes one of quite urgent issues of Georgia, in particular for mountainous Ajara region, as the study area is subject to demographical and economic crisis during recent years. Touristic and recreational resources of mountainous Ajara is evaluated via application of traditional and modern methods and the index of fitness of area usage for touristic and recreational purposes is determined. Geographical originalities of tourism development dynamics and perspectives of operation of some particular types of tourism are found out. On the basis of theories of economic development and taking into consideration of environmental sustainability, originalities of regional economy fields are found out and the place of tourism in local economy structure is shaped. By finding out functioning of state municipal programs, business interests and attitude of local population in line with sustainable development of the region – there are determined a tourism`s priorities, existing challenges and the perspectives of their further development via complex approaches are set.

Session Geo-AI (2)

The impact of artificial intelligence on urban transformation with the blurring of boundaries in smart cities

Ivana Vyslúžilová

This paper outlines the revolutionary process of boundless new technologies with a focus on artificial intelligence (AI) in the most progressive smart cities in Europe. Technological change and the impact of digitalization affect not only today but have played a significant role in the past decades by creating a space for innovations and development in the field of data science. Not long ago we observed an acceleration of higher use of digital technologies, not only through statistical methods of machine learning and deep learning algorithms but also advancements in deep learning artificial intelligence applications. In addition, advantages from speech recognition, image classification, computer vision, and natural language processing have in recent times created a significant phenomenon in which we are more connected than ever before. Different routes to the digital transformation taking advantage of smart infrastructure led to the reduction of boundaries in urban areas. The principal approach of the utilization of smart urban solutions can lead to several interests, together with urban sustainability that can be seen through reduced pollution, more efficient energy, water, and waste management. One of the defining components of innovations of today is the use of a large amount of data. Therefore, the government is applying these data to make more correct decisions and to support more operations that are more efficient. However, we should not exclude the observation that data collection has some real concerns in the context of information security and privacy. In general, we can conclude that it will be crucial to find the balance between the risks and opportunities of AI services that can affect the future of technological trends in smart cities.

Artificial Intelligence, Geopolitics, and the War in Ukraine: a predictable conflict?

Amira Mouakher, Nuno Morgado

Predicting international events, particularly conflicts and wars, remains a challenging task due to the complexities of international relations. In recent years, the integration of Artificial Intelligence (AI) methodologies has shown promising results in enhancing the accuracy and efficacy of predictive models. This paper presents a cutting-edge approach, utilizing AI techniques within the neoclassical geopolitical approach, for forecasting geopolitical events, focusing specifically on the ongoing conflict between Russia and Ukraine as a case study.

 The significance of AI in forecasting geopolitical events arises from its ability to analyze vast and diverse datasets, encompassing multifaceted factors that influence such events. Through the construction of a comprehensive dataset, built upon geopolitical factors, specifically

tailored to capture influential parameters in foreign policy outcomes, this study leverages the power of AI algorithms to extract meaningful patterns and relationships.

Central to our methodology is the development of a robust data-driven model that amalgamates a spectrum of critical factors influencing geopolitical events. Geopolitical factors considered include geographical space and position, circulation or transportation, resources, psychosocial projection on the territory, and politico-military structures. The integration of such diverse data into a coherent predictive framework serves as a foundation for forecasting and understanding the complexities of the Russia-Ukraine war.

The contribution of this paper lies in the development of a comprehensive and adaptable framework that not only focuses on the Russia-Ukraine war but also establishes a methodology transferable to forecasting other geopolitical events worldwide. Through empirical validation and rigorous testing against historical and political data, our approach aims to provide a reliable tool for predictive analysis in geopolitics.

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Modelling spatial uncertainty in sentiment analysis using xAI methods

Iuria Betco, Jorge Rocha, Ana Ribeiro, David Vale

The rise in mental health issues globally could be linked to the increasing number of people living in cities and the lifestyle that goes along with it. Since urban environments have a significant role in promoting or inhibiting lifestyle choices that have an impact on sentiments, there is a growing understanding that these varied characteristics of urban environments can have an impact on people's mental health.

It is critical to comprehend the potential impact of Lisbon's urban environment in this setting. In order to accomplish this, we turned to sentiment analysis, which allowed us to identify locations where both positive and negative sentiments are prevalent. We did this by using a lexicon from the NRC Sentiment and Emotion, which was based on data from the social network X (former Twitter). Four artificial intelligence models were tested: K-Nearest

Neighbor (KNN), Random Forest (RF), Extreme Gradient Boosting (XGBoost), and Neural Network (NN).

Next, an artificial intelligence (AI) model coupled with two agnostic models, the Local Interpretable Model-Agnostic Explanations (LIME) and the SHapley Additive exPlanation (SHAP), were used to increase understanding of the factors in the urban environment that may explain sentiment. Finally, we tried to determine the level of uncertainty characterizing each of the positive and negative responses in each of the models based on their predictive capacity. The results were matched using a maximum entropy algorithm.

The results allowed us to evaluate which places in the city of Lisbon are where it is possible to say with greater certainty where positive and negative sentiments predominate, where the two models agree, as well as where the overall classification is more assertive.

GeoAI (Geospatial Artificial Intelligence) and its applications: a case study of Albania

Dritan Rustja

The integration of Artificial Intelligence (AI) with geospatial technologies or GeoAI, represents a transformative force in spatial analysis and decision-making worldwide. Despite its international relevance, the deployment and exploration of GeoAI in Albania has not been extensively studied. This paper aims to bridge this gap by evaluating the current applications and potential of GeoAI across key sectors in Albania, with a particular focus on agriculture, urban planning, and environmental management. Employing a mixed-methods research approach, this study synthesizes a comprehensive review of the existing literature adapted to the case study of Albania.

Our research uncovers that although GeoAI is in its initial stages of implementation in Albania, it exhibits considerable promise. In the agricultural sector, GeoAI technologies might be leveraged for advanced crop monitoring and yield prediction through the analysis of satellite imagery and the application of sophisticated machine learning algorithms. In urban planning, GeoAI can contribute to improved spatial analysis, which supports more effective infrastructure development and traffic management. The environmental management sector can benefit notably from GeoAI applications in disaster risk reduction and the assessment of climate change impacts, showcasing its critical role in enhancing resilience to environmental challenges.

The findings suggest that GeoAI has significant potential to assist Albania in advancing its sectoral agendas by improving decision-making processes, optimizing resource management, and enhancing policy implementations. Nevertheless, to fully exploit the benefits of GeoAI, Albania must commit to further investments in technological infrastructure and the development of local expertise. The study concludes with strategic recommendations for

accelerating the adoption of GeoAI technologies, ensuring sustainable growth and technological inclusivity.

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Session GIS

Inferential GIS: A Proto-type Application

Gary K. Higgs

Understanding the mechanics and behaviour of populations in a neighbourhood is an important and complex task. Using aerial photographs of a neighbourhood in St. Louis Missouri from 1955 and 2020, this research created GIS objects of the area by layering the date appropriate infrastructure and attribute tables to identify land use change. On the basis of the identified changes, the influence and forces acting upon population behaviour can be isolated and their impact upon urban environment structure evaluated. The study model employs a standard group of socio, cultural, and economic indicators with values assigned or measured over the study. These values were applied to the GIS objects through an inference engine associating different indicator values with the observable changes in the urban neighborhood. The inference values and their attached exponents reflect the impact of the event triggers of the agents; the association revealed dynamic linking structures, activities, circulation, and land use evolution reflecting a sequence of events, triggers, and causes, and suggests behaviours and agents as a time-vision tool to highlight and focus the forces and agents promoting change.

Breaking out of the "ivory tower": community experts and student novices in a community-engaged introductory GIS course

Federica Bono

Community Engaged Learning (CEL) is a pedagogical approach that involves students, community partners, and instructors working together to analyze and address community-identified concerns through experiential learning. Implementing community-engagement in geography courses and, specifically, in GIS courses seems logical and is not new. However, typically these involve advanced GIS courses and thereby risk excluding students and community members who lack GIS skills. Additionally, often these courses are limited to an iteration of service learning, with a focus on students as the "experts" providing a service for community partners. In contrast, community-engaged pedagogy centers social justice in that it seeks to promote public good and redistribute power in more just and equitable ways. This paper presentation presents the experiences from and pedagogical materials that were developed for a community-engaged introductory GIS course, taught on a small university campus in Virginia (USA) in Spring '24. As so many college campuses in the U.S., this university was made possible by the uprooting of an established Black neighborhood. Currently a so-called predominantly White institution, the university is committed to building diversity. It is within this context, that the introductory GIS course was completely redesigned to form reciprocal partnerships with community members, requiring students and the professor to

break out of the "ivory tower" model and challenge the hierarchies that currently define higher education. This presentation will address how the course helped students gain a conceptual understanding of what is GIS, how to use it, and valuable software skills, while also reflecting about their own privileges, how GIS can empower the community, and their own role as a GIS analyst. Ultimately, the presentation will show how the course supported positive changes in the community, equity in education, reciprocity in university/community relationships, and student civic mindedness.

Geography the world today. The contextualisation of where?

Juan Antonio García González

The dissemination and coexistence with geolocated information is increasing and in more and more diverse environments. The network, geolocation and the democratization of devices that can access them anywhere are generating a silent change in the way we relate to and understand the territory. A reflection is presented on the role that the diffusion of the use of geotechnology is having in our society. It is presented through a series of examples that highlight its importance in many areas of everyday life. They range from routine and local phenomena to processes that mark the course of our lives as a society. Concrete and current phenomena that can be followed in real time to intangible processes of intangible heritage.

Geography should broaden its horizons by extending its transversality and its intertwining with society. It should be a contemporary science that is close to the citizen and helps to understand the infinite number of territorially based processes and phenomena that are occurring at a dizzying pace today.

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Methodology of creating maps of age-friendliness of urban spaces using GIS tools

Marta Czaplicka, Agnieszka Dawidowicz, Małgorzata Dudzińska, Adam Senetra

Assessment of age-friendliness of residential estates is a considerable challenge local authorities are facing to pursue a sustainable pro-ageing policy. As a response, an innovative methodology for identifying age-friendly housing estates in cities in terms of infrastructure and landscape determinants was developed to enhance the future social and spatial policies of cities, basing on the "active ageing" concept.

The methodology was basing on the international guidelines and recommendations along with a survey data from the target international population and information provided by experts, enabling to create a list of the benchmarks of a friendly infrastructure and landscape in housing estates.

The study presents results of a test carried out in Gdańsk, Poland, a capital city of the Pomeranian region, showing the possibilities of using the free GIS software to develop age-friendly maps of the city.

Along with the developed list of criteria influencing the friendliness of housing estates for older citizens such results can be useful for public entities in planning policies, as well as for private entities to manage their investment plans or for real estate agents to explore the real estate market for the needs of older clients.

Session Human Geography

Health map of Spain

María Zúñiga Antón, Carmen Bentué Martínez, José Antonio Salvador Oliván, Nacho Quílez Aznar, Severino Escolano Utrilla

A health map is a representation of territorial boundaries in which aggregated human health events, population and territory characteristics, and health resources are recorded. Therefore, they are essential tools for planning and managing healthcare services, evaluating health policies, and for researching epidemiology and health geography. Digital health maps have great analytical and visualization capabilities for the spatiotemporal incidence and spread of diseases, risk factors, and other determinants of health.

 The Primary Health Zones (*Zonas Básicas de Salud*, ZBS) are the administrative units for the organization and allocation of resources and healthcare services in the public health system in Spain. The autonomous communities have the authority to define the ZBS within their territory, taking into account criteria such as the population size to whom healthcare services will be provided, accessibility to health centres, and other geographical factors (RD 137/1984; BOE nº 27, 01/02/1984). However, this decentralization has posed challenges in creating an official and unified healthcare map of the entire national territory and has generated difficulties in standardizing healthcare information, as evidenced during the COVID-19 crisis.

 This work presents a digital health map of the Primary Health Zones and healthcare sectors in Spain. It comprises georeferenced unified information for the national territory regarding ZBS and healthcare sectors, along with demographic and socioeconomic indicators for each ZBS.

Leveraging geospatial technologies to capture spatial variation between associated factors and cardiovascular mortality

Suzana Lović Obradović, Stefana Matović, Gorica Stanojević, Nina Ćurčić

For decades, Serbia has been struggling with cardiovascular mortality (CVM) as the leading cause of death. The unfavorable age structure of the population, lifestyle habits, access to health care, and increasingly pronounced temperature amplitudes contributed to this unenviable situation. Serbia is characterized by certain physical-geographic and socio-economic spatial disparities, so the differentiation of CVM is noticeable at lower territorial levels. The mentioned differences may influence spatial variations in the intensity of the associated factors' effects on CVM. This paper used Geographically Weighted Regression modeling to determine spatial variation in relationships between factors (demographic, socio-economic, and health), as explanatory variables, and cardiovascular mortality, as a dependent variable. The study was carried out with data from 2022, as the most recent

available, at the municipality level (LAU 1). The findings revealed the variations in the relationships between explanatory variables and CVM at the local level, as well as differences in direction and strength in those relationships. The cartographic visualization of the obtained results enabled us to identify the leading factors influencing the CVM in each municipality (168 units). The findings are significant because they focus on the lower territorial levels, providing insight for decision-makers to develop place-specific (local) strategies for CVM prevalence and reduction.

Smartphone Google Location History: A New Method for Longitudinal Physical Activity and Exposure Assessment Research

Amram Ofer, Oje Olufunso, Larkin Andrew, Avery Ally, Gebremedhin Assefaw, Duncan Glen Hystad Perry

Environmental exposures and physical activity (PA) are commonly estimated using spatial methods, with most epidemiological studies relying on home addresses or Geographic Positioning System.1 Passively collected smartphone location data, like Google Location History (GLH) data, may present an opportunity to integrate existing long-term time–activity data.2 The aim of this research is to evaluate the potential use of GLH data for outdoor PA and exposure assessment research. Methods: We collected GLH data for 359 individuals participating in the Washington State Twin Registry (WSTR). First, we summarize GLH trip classifications and measures relevant to outdoor PA and examine spatial-temporal patterns. Next, for a sub-set of 25 participants who completed 2-week GPS monitoring we compare accelerometer measurements for GLH classified as walking compared to in a vehicle. Finally, we conducted an analysis of the association between GLH measured walking times with self-reported obesity, using cross sectional data previously collected in the WSTR. Results: The average months of GLH time-activity data per participant was 52 (SD 18.8), which included an average of 2,421 (SD 1,632) classified trips per participant, encompassing 79,994 unique walking trips (11.6% of all trips), 11,974 cycling trips (1.7%), and 890 running trips (0.1%). 62% of these trips had location accuracy over 80% and could be mapped and linked to environmental factors (e.g. temperature/precipitation, walkability, green space, etc.). In the accelerometry evaluation, GLH trips classified as walking had corresponding mean vector magnitude (VM) measures of 3,150, compared to 489 for trips classified as in a vehicle. In adjusted cross-sections analyses, an IQR increase in GLH outdoor walking minutes per month was associated with a 21% (95% CI: 3-39%) reduction in the odds of being obese. Conclusions: GLH data presents a novel method to measure long-term retrospective outdoor PA that can provide new opportunities for PA research.

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Household responsiveness to climatic and livelihood shocks: Results from a first-round survey in Ethiopia

Dylan Munson, Marc Jeuland, Rahel Bekele

The Distributed Renewable Energy-Agriculture Modalities (DREAM) project aims to catalyze increases in agricultural productivity and investment in Ethiopia, and to reduce climate risks, by giving access to mini-grid-powered irrigation technology to over one thousand hectares of farmland (Ingram et al., 2022). In this paper, we use data from a survey of 923 households conducted prior to the DREAM intervention to examine the link between responsiveness to household-level shocks—including natural disasters such as those induced by climate change—and farm-level characteristics, in particular crop diversity. We use three main measures of crop diversity in our specifications: the number of crops grown on a farm, a composite entropy index (CEI), and a Berger-Parker (BP) index (Tesfaye and Tirivayi, 2020). This project contributes to a growing literature on adaptation to natural and economic shocks, in particular in agriculture-dependent developing countries. The depth and breadth of this survey make it uniquely well suited for studying many of the questions facing researchers of climate change policy in Ethiopia and beyond.

Probit and biprobit regressions imply the absence of a strong link between crop diversity and responsiveness, a finding supported by instrumental variables results. Most other potential determinants of responsiveness we investigate also turn out to be insignificant when using probit and biprobit specifications, with some notable exceptions, such as the reception of a gift or transfer by the household, perhaps suggesting an important role for social support networks. To further investigate this possibility and the localized nature of responsiveness, we fit a latent variable Gaussian process (kriging) model to the georeferenced household data. To our knowledge, this is a fairly novel use of such a spatial model to investigate household resilience in this kind of context. We do find a large degree of spatial autocorrelation in responsiveness to shocks, and our model indicates that the scale at which such autocorrelation occurs is a highly localized neighborhood (about 3 to 3.5 kilometres) around each household. This finding, combined with the results from the regression analysis, suggest that further investigation of local network and geographical effects is warranted.

Childcare policies and social sustainability in Bosnia and Herzegovina: A case study of the Canton of Sarajevo

Gekić Haris, Bidžan-Gekić Aida

In this paper, we consider childcare policies in the Canton of Sarajevo, Bosnia and Herzegovina. The Canton of Sarajevo, with its territory, makes up 2.5% of the total area of Bosnia and Herzegovina, while with about 420,000 inhabitants, it contributes 13.1% of the total population of Bosnia and Herzegovina. The decrease in the number of live births and the lack of a labour force, as well as the provision of the best possible care for children, are some of the main reasons for the adoption of new policies with child care measures. Regarding this, the decision on the drafting of the Demographic Development Strategy of Canton Sarajevo, which is the first of its kind in Bosnia and Herzegovina, is highlighted. The imminent adoption of this strategy and the implementation of the foreseen measures would significantly improve the demographic development of the Canton of Sarajevo, but also of the whole of Bosnia and Herzegovina, especially through the replication and adoption of similar measures in other parts of the country. In terms of importance, two measures within the framework of the childcare policy that have been implemented for the last few years stand out in particular: financial compensation to new mothers in the amount of the average net salary in the entity of FBiH for a period of 12 months, and co-financing of the costs of children's stay in kindergartens in the amount of 50% per child.

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Session Migrations

A new measure of the attractiveness of the countries for a migrant entrepreneurship

Rossen Koroutchev

The present study explores the appeal of engaging in entrepreneurial activities across different European countries and how to measure it effectively. It relies on established indices by the World Bank and an index focused on migrant integration derived from the MIPEX countries. A novel index, called the Migrant Entrepreneurship Index (IMIGRENT) has been introduced to enhance the quantification of a country's attractiveness for entrepreneurship activity by considering additional factors, such as company registration processes, personal affairs, accommodation and environmental conditions among others. Specific inquiries about national legislation provide insight into a country's appeal. The evaluation of a country's attractiveness depends on the entrepreneurs' preferences and their diverse needs as well on citizenship of the aspirants.

An interesting example is Spain, where the ambiguous rules about residence procedures, which lead to lowering the total index, are compensated by healthcare or the good climatic conditions. Germany is also an interesting example as rules are very transparent and well applied. However, there are additional economic barriers that lead to decrease of its IMIGRENT score. Finally, a comparative analysis is presented for several European countries.

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The militarized and elastic border between the U.S. and Mexico: Experiences of migrants and asylum seekers

Elizabeth Chacko, Marie Price

Securitization of the US-Mexican Border has been a focus of the U.S. Department of Homeland Security since its formation two decades ago. Wall building, especially in the lower Rio Grande Valley, was an essential component of the Trump administration's deterrence policy. Additionally, in 2020, the public health order Title 42 was used as a tool to expel unauthorized border crossers and asylum seekers, citing concerns about the spread of COVID-19. However, by 2021 some groups were given waivers or allowed to cross from Mexico into

the USA on humanitarian probation. These included asylum seekers from Venezuela, Haiti, Nicaragua, Ukraine, and Cuba and as well as unaccompanied minors from Central America. Despite physical and legal barriers, large numbers of new and diverse groups continue to attempt to enter the US from Mexico. In this paper we investigate how changing U.S. policies affect migrants from different countries. We also examine strategies used by migrants and asylum seekers who wish to enter the USA, through a case study of migrant crossings in the Lower Rio Grande Valley.

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Urban-rural migration - opportunity or threat for rural areas in Poland

Monika Wesołowska, Anita Kulawiak

The paper presents the conclusions of part of the research conducted within the framework of the research project: ""Rural-urban knowledge transfer - models of interdependence"" carried out by a group of researchers from Poland. The project in its fundamental-theoretical assumptions refers to the contemporary discourse related to the socio-cultural turn in geography. The essence of the project is the identification and description of the wide-ranging interactions that take place between old and new villagers, including users of second homes. Ultimately, the research aims to develop a model of interdependence in urban-rural transfer of knowledge and information. The project has 4 specific goals, i.e. to identify and diagnose the groups of newcomers and the forms of their migration to the countryside, to identify the categories and types of knowledge subject to transfer, to determine the dominant directions and intensity of knowledge transfer, and their consequences. The paper presents the preliminary results of research related to the realization of the first objective, including an attempt to answer 4 questions:

• What types of groups of people migrate to the countryside?

• What forms does this migration take?

• Where are migrants concentrated in Poland?

• What are the characteristics of this rural space?

The results presented here are the result of interviews conducted with key respondents (public sector (local government, important rural institutions), civil society groups (e.g.

NGOs), incomers (leaders, new farmers), as well as surveys and field observation. The survey targeted a purposive sample of respondents adequate to the subject of the research (oldtimers and newcomers).

Since the 1990s in Poland, but also in other countries (including the UK, USA, Spain), there has been an increased influx of people from the city to the countryside. This has its far-reaching consequences, which are revealed in both the social, economic, spatial and cultural aspects of the countryside. Cloke (1997) points out that one of the research problems of contemporary rural studies concerns the forms of consumption of rural space by different groups of visitors to rural areas, both those coming temporarily (tourism and recreation) and those seeking places for alternative lifestyles in the countryside. The described project should contribute to the contemporary discourse in the field with aspects related to mutual learning, knowledge transfer between newcomers to the countryside and old residents and vice-versa, as well as perceptions of mutual competence.

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International student migration in a Serbian context: Socio-cultural integration experiences

Vesna Lukić

In the last decades, the number of international students has greatly increased worldwide linked with the internationalization of higher education. The highest number of residences permits ever were issued for international tertiary-level students across OECD European countries in 2022 (OECD,2023). International students are a valuable human resource to the host country, which is particularly important for the ones with fertility rates below the replacement level (Hawthorne, 2010). Therefore, there is a growing interest in research on international student migration patterns, motives, experiences, challenges, and opportunities within different disciplines, including human geography. However, this is an underexplored topic within scientific research carried out in Serbia, which is traditionally an emigration country but with a long tradition of educating scholarship holders abroad as well as educating international students at domestic universities. According to the UNESCO Institute for Statistics (2016) definition of international students, this paper considers an international student to be a person who received their prior education in another country and is not a resident of the current country of study. The paper presents the first findings from an ongoing research project on international student migration and identity nexus in a Serbian context. These findings are focused on research on their socio-cultural integration experiences in the country of study. The results are based on analyzing additionally processed 2022 Census data in Serbia on international student population, and original data collected by focus group research among three groups of students (students from Serbia who have been studying abroad for at least one year, young highly educated professionals under 30 who returned to Serbia after studying abroad, and international students who have been studying in Serbia for at least one year) enrolled in tertiary education and by following a mixed-methods approach.

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Session Urban geography

Measuring rapid transit accessibility and equity in migrant communities across 17 European cities

Alexandros Bartzokas-Tsiompras

Migrants in cities are highly dependent on frequent and fast public transport services. Easy access to rapid transit stations, such as subways or suburban rails, plays a crucial role in shaping migrants' daily lives and critically influences integration processes at the local level. Nevertheless, in Europe, little is known about migrants' access to rapid transport facilities. This article is the first one that provides comparable local indicators of rapid transit accessibility and equity in the supply of transit services for various migrant and non-migrant groups across 17 European cities. Our analysis was based primarily on an innovative European spatial dataset about migrants' concentration in cities as well as on several openly available general transit feed specification datasets. Methodologically, we used a classic gravity-based accessibility model, where the average frequency of daily departures was assumed as the attractiveness factor of the instrument. On the other hand, we performed Gini coefficient analysis and created Lorenz curve graphs to assess transit equity. The results allowed us to make inter- or intracity comparisons and to demonstrate some of the most transit disadvantaged migrant communities in Europe. Our findings suggest that Africans experience on average the worst access, while Americans, in the vast majority of cities, are located in high-access districts. Also, transit equity assessment demonstrated a high level of inequality across all population groups and cities, except Barcelona. A striking result was that 88% of Africans in Turin shared only 10% of rapid transit supply. However, it was confirmed that regardless of people's nationality, in many cities around Europe, it is difficult for many dwellers to live in close proximity to subways. Therefore, better land-use and mobility policies are required to guide cities towards more inclusive and sustainable urban development.

Urban art and revival of public spaces. Insights from Romanian cities

Andreea-Loreta Cercleux, Elena Bogan, Radu Săgeată

The present research focuses on the urban art analysis from a geographical perspective at the level of Romanian cities. Both the evolution of graffiti and street art phenomenon and the urban art participation in different projects of cities transformations (functional and image changes, tactile urban projects etc.) are tackled in this study. In recent years, local policies rely more frequently on creative industries in conducting processes of urban regeneration in public spaces [1], by including urban art beside other alternatives. Hence, urban art can be the answer to forgotten, abandoned, vandalized, non-functional places. In this study, the quantitative analysis was led together with field research, documentation and data collection from various sources. The results reveal that the urban art phenomenon has experienced

lately an explosion in many cities from Romania, big and medium-sized ones, with works that transmit a varied range of messages and having impact in the local environment. Therefore, urban art works play a significative role in the advance of creative activities, tourism, urban image and local economy [2]. In many cities worldwide street art already participates as a tool in the processes of public spaces regeneration [3] and even acts as "city branding" [4]. Urban art becomes that kind of emerging art that engenders new businesses and jobs, having thus multiple economic values.

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UNESCO Creative Cities in the inland-Centre of Portugal

Pedro Vaz Serra, Cláudia Seabra

The UNESCO Creative Cities Network (UCCN) was created in 2004 to promote cooperation with and among cities that have identified creativity as a strategic factor for sustainable urban development (UCCN, 2024).

 In the inland-Centre of Portugal, there are three UNESCO Creative Cities. Due to their location, these cities have specific characteristics and have become areas which have seen a systematic decrease in population, with progressive ageing and, at the same time, increased difficulty in keeping and retaining younger people (Pordata, 2024).

 We propose a comprehensive approach, drawing up a SWOT analysis for each case, a summary of the most relevant economic activity, and how they have incorporated the status of Creative Cities into everyday life and cultural programming (Pordata, 2024; UCCN, 2024).

 Suggestions for development and/or improvement will be made, bearing in mind how the specificities of each of the cities can achieve competitive and sustainable advantages in and through it (UCCN, 2024).

The data corresponds to five years, between 2019 and 2023, and will be obtained from official and secondary sources.

We aim to contribute to a more detailed knowledge of the reality associated with Creative Cities, particularly those located inland, which are therefore faced with challenges and limitations that they want to face and overcome.

By sharing good practices, as well as comparative analyses, it will be possible to have a more realistic view of how the UCCN can be a factor in economic and social growth and development for the territories.

Contributions to science, management, and operators, public and private, are envisaged.

For science, as we do not know of any identical study, to date. For the management of the UCCN itself, which will have access to new data on the current reality and future perspectives, as well as the Creative City team on site. For operators, the observation of a reality that is susceptible to evolution implies assertive actions.

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Innovations in daily commuting - European case study

Ada Wolny - Kucińska, Małgorzata Dudzińska, Agnieszka Dawidowicz, Marta Gross

Innovations drive dynamic changes in daily commuting in European functional urban areas (FUAs) (Dijkstra et al., 2019; OECD, 2019). Innovative solutions pose an alternative to conventional transport systems and revolutionize daily commuting in cities and suburbs. The paper discusses the connection between the level of innovation utilization in daily commuting and its impact on travel behaviour (TB) and economic development of different countries in Europe. Innovative factors were comprehensively identified and classified (Dzudzińska et al., 2023) taking into account similarity in prioritizing innovations influencing TB in different countries.

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Ageing in cities - modelling the cities of the future

Nikola Koktavá, Jiří Horák

The Active Ageing (WHO 2007) initiative aims to help urban planners improve neighbourhoods and build socially inclusive and sustainable cities for the elderly. One crucial factor for well-being and quality of life of seniors is spatial mobility. Spatial mobility is not intended to fulfil only physiological needs; it is an important part of social cohesion and the essential condition required to retain independence and self-reliance. Usually, mobility is classified according to the distance zones where the ability to leave the dwelling to access the close neighbourhood is understood as an essential milestone in mobility. Individual ability, personal conditions, and temporal and persistent features of the outside environment determine external spatial mobility. Among crucial features is the availability of selected street furniture. The question is how to measure it, how seniors perceive it, and whether they are satisfied with the offer. The study is focused on assessing differences between the perceived accessibility of benches based on the questionnaire survey in two regional capitals in Czechia (Ostrava and Hradec Kralove) and several measures of accessibility, including kernel density estimations and distance-based indicators. The results confirm a good consistency among various accessibility measures and a significant positive association between these indicators and the perception of seniors. In our cases, the explained variability of indicators can reach up to 20 %, modified by individual personal factors. Urban and regional differences also play a role in the variability of these indicators.

Session Geography from Portugal

Unworthy housing in Portugal

Teresa Sá Marques, Fátima Matos, Caratina Maia, Diogo Ribeiro, Paulo Conceição, Isabel Breda Vázquez, Isabel Martins, Paula Guerra, João Queirós, María Neto, Pedro Neto

Unworthy housing is one of the main factors that contribute to worsening the living and health conditions of people living in this situation. The concept of the right to decent housing, developed by the UN (2002), includes several dimensions: habitability; guaranteeing access to basic infrastructure and emergency services; legal protection of occupation; housing costs must not jeopardise the satisfaction of other essential family needs; location must guarantee accessibility to employment and essential services; building materials and underlying policies must allow for the expression of identity and cultural diversity. These different dimensions go far beyond the concept of shelter, as they also include the dimension of habitat. In 2007, FEANTSA published ETHOS Light, which aims to be a harmonised definition of homelessness for statistical purposes, considering the following categories: homeless (without shelter of any kind, sleeping on the street); without accommodation (with a place to sleep, but only temporary, in institutions or shelters); living in insecure housing (due to precarious tenancies, evictions, domestic violence) and living in unsuitable housing (in caravans, on camping sites, in squat or unsuitable housing, in extreme overcrowding).

In Portugal, the survey carried out by the IHRU in 2018 considered the following situations to be housing shortages: shanties or precarious constructions; clandestine encampments; campsites; social housing estates run-down; 'urban areas of illegal genesis'; run-down urban neighbourhoods and housing in risk areas. However, it does not include other situations of housing shortage, such as overcrowding, the accommodation inadequacy in relation to the occupant's characteristics (namely people with reduced mobility), and situations of domestic violence, homelessness, among others, included in the aforementioned studies. The documents cited show the persistence and centrality of the issue of decent housing, but also the complex, contextual and evolving nature of the concept. The debate associated with it therefore has a number of challenges. It is against a backdrop of a structural housing crisis, in confluence with new contours emerging from the aftermath of the 2008 crisis and the Covid pandemic, that unworthy housing must be analysed from a relational perspective that crosses the various dimensions of change.

The aim of this communication is to present and discuss a project under development. It analyses a set of indicators (housing and socio-economic) that shape unworthy housing situations and explores a methodology that aims to cross-reference problems associated with unworthy housing with social profiles and social vulnerabilities. The project aims to contribute to public policy models in order to support housing policies anchored in the territory, capable of responding effectively to the challenges faced in different geographical contexts.

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The concept of equity and theories of justice applied to issues related to inequalities in transport and mobility

Andreia Monteiro, Miguel Saraiva, Teresa Sá Marques

Muitos países em todo o mundo comprometeram-se com o Objetivo de Desenvolvimento Sustentável (10) das Nações Unidas que visa alcançar a redução das desigualdades (Randal et al., 2020). Sendo o sistema de transportes um fator importante, pois influencia o bem-estar de todos (Verlinghieriÿ & Schwanen, 2020) e gera grandes desigualdades (Randal et al., 2020), nos últimos anos aumentaram os estudos e a investigação sobre as questões da justiça e equidade nos transportes e na mobilidade (Pereira et al., 2017; Verlinghieriÿ & Schwanen, 2020). No entanto, apesar da centralidade destas questões e os avanços conseguidos no planeamento dos transportes, há pouca clareza conceptual sobre o que significa justiça em matéria de transportes (Pereira et al., 2017).

Se por um lado Pereira et al., (2017) afirmam que não existe uma definição única e abrangente de justiça, e inclusive usam os termos equidade e justiça indistintamente, por outro lado, Verlinghieri & Schwanen (2020) defendem que investigadores de diferentes áreas e comunidades têm utilizado os mesmos recursos conceptuais nas tentativas de examinar questões de justiça nos transportes ou na mobilidade.

Através de um estudo teórico de caráter bibliográfico, focado nas publicações científicas dos últimos anos, pretende-se trazer para o debate e reflexão a conceptualização da equidade e das teorias da justiça distributiva, aplicadas às questões das desigualdades nos transportes e na mobilidade.

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Climate Change and the Increase in Disasters Related to Hydrometeorological and Climatic Events in Mexico

Gabriela Narcizo de Lima, Roberto Ariel Abeldaño Zuñiga, Deysi Ofelmina Jerez-Ramírez

Mexico is highly vulnerable to climate change and extreme hydrometeorological and climatic events, mainly due to the rapid growth of urban centres, deterioration of rural areas, and its high levels of poverty. Between 1970 and 2021, 210 disastrous hydrometeorological and climatic events were registered in the country, which generated a total of 6,728 deaths, 3,176 injured people and 7,636,419 affected, being Veracruz, Oaxaca, Chihuahua, and Sonora the most impacted states. Despite the efforts made to create strategies aligned with the Sendai Platform, Mexico continues to present alarming indicators of vulnerability and exposure to different threats, including those of climatic and hydrometeorological origin. One of the main future challenges for the country is finding a way to encourage the participation of communities in the transformation of structures, linking the different social actors in the process of generating public policies on disaster risk and climate change.

Landslide risk analysis in Portugal: an insight into the municipal level

Susana Pereira, Pedro Pinto Santos, José Luís Zêzere, Alexandre Oliveira Tavares, Sérgio Cruz Oliveira, Ricardo A. C. Garcia

Landslides are geomorphic processes that often cause damage, directly and indirectly, to populations, economic activities, and transport networks. This work presents a methodology for assessing the landslide risk for the 278 Portuguese municipalities, based on the design of standardised indices expressing three driving forces: hazard, exposure, and physical vulnerability of buildings (Pereira et al., 2020). The input data includes raster datasets regarding hazard and exposure that were processed for representation at the municipal, and statistical information collected for each municipality to assess the physical vulnerability of buildings. The calculation of a municipal landslide risk index and the cluster analysis of the respective three driving forcers enables the identification of which component of risk should be prioritised in risk management at the municipal level.

Education and territorial development strategies: the case of the Northern Region of Portugal.

Hélder Santos, Diogo Ribeiro, Marcelo Torres, Fernando Honório, Catarina Maia, Teresa Sá Marques

The aim of this work is to explore and recap the educational territorial mosaic that is emerging in the Northern Region of Portugal. It is a contribution to the Regional Spatial Planning Programme of this region (PROT-Norte). The PROT is a multidimensional document that covers different areas of diagnostic analysis, with the aim of building a territorial model and designing strategies and agendas for the transformation of the territory. One of the dimensions taken into account in this modelling is that of education (Ramos & Marques, 2023). The PROT must propose place-based policies (Barca, McCann, & Rodríguez-Pose, 2012). These policies have the potential to promote socio-economic change at regional local level and form the basis of the European Union's territorial cohesion policy. It is therefore useful to characterise the educational territorial mosaic of the northern region as a starting point for the construction of territorially rooted public policy proposals.

Methodologically, a database has been created with indicators such as: direct routes to success, retention and dropout rates in basic education, the population aged 18-24 with a third cycle of basic education that is not in the education system, the population aged 25-44 without secondary education, among others. The indicators were then categorised and mapped. Finally, profiles were identified and the territorial mosaic was extracted using multiple correspondence analyses.

In terms of education, the northern region shows a diversity of education and training contexts. The larger urban centres tend to have more diversified supply and demand and better indicators of educational attainment Nevertheless, there are weaknesses in these areas and there is a great diversity of educational contexts within the municipalities. The less densely populated areas have less favourable contexts, with less diversity of supply and demand and less favourable indicators of educational attainment.
The territorial mosaic that emerges from this analysis supports the option of place-based education policies that prioritise and provide quality education for all pupils – educational equity – and that create the necessary conditions for pupils' performance to be free from the constraints imposed by the diversity of local and family socio-economic contexts – educational justice.

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Session Geography education from Portugal

Integration and multiculturalism: essays on EBS Fontes Pereira de Melo

Ana Ferreira, Elsa Pacheco, Francisca Teixeira

As a result of the intensification of population flows on an international scale, one of the most interesting consequences is the promotion of multicultural societies. From the diversity of these people's origins, among other practices and lessons, we must identify the opportunity for integration and solidarity in human development.

In line with this idea, as responsible agents for the education of young people in Portugal, we can't fail to note the challenge facing primary and secondary schools which, prepared to respond to the teaching and learning needs of these age groups, have been confronted in recent years, with a growing number of students from very different geographical origins.

However, despite the defence of an education system centred on the student, which should develop according to a humanist and integrative profile, its physical organisation (19th century classrooms) and dominant working methods (more teaching than learning) seem to suggest the opposite - its homogenisation.

In order to resolve these contradictions, we have tested working methodologies that aim, on the one hand, to analyse the points of view of teachers and students on the "integration" of foreign students at school and, on the other, to test methodologies that could prove to be fundamental in demonstrating the added value of this heterogeneity of geographical origins for teaching and learning in Geography. To realise this goal, we used surveys and activities, which results allow us to suggest that the existence of problems that go beyond the school context is overlaid by the obvious richness of being able to teach and learn from difference.

eTwinning Projects at School – The Importance of the Noosphere in the Dissemination of Geographic Knowledge

Elisabet Fiel

The Noosphere presents itself as the sphere of knowledge, linking collective intelligence and its impact on the planet. The eTwinning project is a strand of the Erasmus+ programme, hosted on the European School Education Platform and funded by the European Commission. It promotes projects among different classrooms in 46 countries, in 30 different mother tongues, using the PBL (Problem-Based Learning) methodology.

The project method is based on constructivism, placing students in real-life scenarios close to the actual situation, seeking collaborative solutions. In this sense, the teacher's role is to guide the work process and create challenging stages based on the curriculum content and the competences to be developed by the students.

The phases of PBL include selecting the theme, researching, developing collaborative work, creating products, disseminating and evaluating the results. The projects activities are carried out collaboratively between the partner countries, starting with geographical location, working on interdisciplinary projects, building knowledge and seeking answers to common problems.

One of the projects I developed as a Geography teacher was the 'Time to Travel' project, with partners from Ukraine, France, Spain, Bulgaria, Poland, Italy, Czechia, Croatia, Portugal, Estonia and Greece. The project aimed to present different countries, regions and commonalities through a 'Travel Agency' scenario, exploring each region of each country. The students made presentations, video conferences, games and created shared materials, contributing to collective knowledge.

eTwinning offers peer-to-peer learning opportunities for students and teachers, and also stands out as an excellent opportunity for Initial Teacher Education. The knowledge of remote regions and the closeness through the use of the platform facilitates contact, helping to bridge real and cultural distances.

Geographical Information and Geographical Education: reflexion on the concept of a geographical powerful knowledge

Madalena Fonseca

Following the change in the legal framework in Portugal, as in the rest of the European Higher Education Area (EHEA), with the mandatory requirement of a master's degree (2nd cycle of professionalizing studies or master in teachers' training) in order to access the career of school teacher, teachers' training has become increasingly research-based.

The link between research and teaching and learning is not a new topic. Schulman's reference article from 1986 - Those Who Understand: Knowledge Growth in Teaching - continues to be cited today because it is still valid in its argumentation of the foundations of this relationship. This paper aims to bring together theoretical contributions, critical analyses or inspiring personal reflections based on experiences, good practices, and innovative methodologies on the relationship between research and the teaching of Geography. How and why should we bring together university academics and school teachers, as well as researchers in the field of Geography or teachers' training in general? Territorial knowledges: part of being an educated person in the future! was the Editorial of an issue of the Journal of Geography in Higher Education in 1995. How can we ensure geography education for our children and young people in schools, as a critical pillar of education for citizenship, ethics and responsibility?

This article is an exploratory experiment in discussing the concept of Powerful Geographical Knowledge within the framework of the relationship between academic geography and school geography. This preliminary approach to this question includes a questionnaire

launched to different stakeholders. Beyond the positive and negative aspects and the current barriers, it is possible to recognise a unanimous consensus around the idea that the university must go to school and that the school must go to the University.

Teachers for what? - inertia and emergence in portuguese basic education

Elsa Pacheco, Laura Soares, Paulo Lemos

Between the massification of education and the extension of compulsory schooling, the portuguese education system has been pursuing the goal of the World Declaration on Education for All - the "fulfilment of basic learning needs" (UNICEF, 1990). However, as in other countries, there is still resistance to the urgent change in curricula and school organisation. In other words, it seems that the perpetuation of educational evaluation centred on school results (usually in rankings) disguises the training paths that are fundamental to true human empowerment - 'being, the essential'.

In line with these ideas, some questions emerged such as: why is there so much resistance to changing the 'essentials'? Do times change, but not wishes? Where have changes been taking place in the portuguese education system? After all, how can we change the school in the current context?

We revisited Smith's (1779) and Marshall's (1890) human condition for the progress and wealth of nations, looked at Schultz's Theory of Human Capital (1963 and 1971), noted Gusdorf's (1963) answers to the question 'Teachers for what?' and recalled the Modern School Movement, positioning the school as a place in education. For Higher Education, Recommendation no. 4/2022 calls for the participation of young people (DR 124/2022), identifying a number of problems with the pedagogical model, including the fact that it is unidirectional, i.e. if the University should support change, why can't we innovate?

We hope to find some answers through a cross-analysis between desires (1) - based on the principles of education defined in legal documents; supply (2) - approached from the point of view of the curriculum and the training of Geography teachers; and demand (3) - based on the dimension of students who choose Geography.

In the conclusions, we will present some ideas aimed at stimulating the desirable process of change in the education system.

EUROGEO projects Session

Integration of consumer education in primary schools: research findings and implications

Daniela Scheminck

Advertising, communication, clever sales tactics, spontaneous incentives, personal preferences, habits, traditions, convenience and even a growling stomach - all these and probably much more influence our consumer behaviour to varying degrees. We all make a lot of conscious and unconscious consumer choices every day. However, because of their considerable purchasing power, children and young people are a preferred target group for companies and their product marketing. From an advertising perspective, they are seen as a ""worthwhile investment in the future"" in terms of customer loyalty.

It is therefore crucial to introduce children and young people to responsible consumer behaviour at an early age. Consumer education in schools aims to help children from primary school onwards to develop responsible consumer behaviour. Consumer education is seen as a lifelong process and a fundamental element of education that prepares students for current and future challenges in their personal and professional lives. But how can consumer education be integrated in a meaningful and sustainable way into the daily life of primary schools and especially into the curriculum? The paper presents initial research findings from the Re3PriS project and describes selected classroom projects through which teachers can contribute to the promotion of consumer education and thus education for sustainable development in primary schools.

Virtual Field Work in the context of Global Change - a Blended Learning Approach for Higher Education

Sophie Wilson

Understanding the meaning of our changing world is part of Geography Education. Technical innovations often play an important role in helping us to explore Compromised Geographies of our increasingly less connected and deglobalized world. Virtual field trips therefore offer an important collaborative blended learning approach to assist with this, by utilizing digital and innovative teaching approaches to enhance student learning, making it more accessible to a diverse range of learners, in a less integrated world, where local solutions are becoming increasingly valued.

The aim of this session is to introduce the V Global MOOC that has been created to enhance environmental education within higher education institutions and support university teachers in adopting digital and innovative teaching methods, using virtual field trips and participatory tools. Raising awareness about global change serves as a catalyst, enabling educators to incorporate sustainability topics into their teaching and develop effective pedagogical

strategies. The session will include case-study examples from several different cities which can be used by attendees to teach with or as a starting point for creating their own future virtual field trip using the range of innovative tools presented. In this way V-Global serves to guide university educators to adopt this approach, by raising awareness of the digital tools supported with freely accessible free practical training.

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Empowering academics to develop a global change curriculum in higher education: challenges and barriers

Caroline Leininger-Frézal

Face to global change : a university challenge. Preparing young people to cope with global change is one of the challenges facing universities. The aim is to mitigate these phenomena by informing people, building their resilience and their capacity to adapt to it (Mochizuki & Bryan, 2015). How is the topic addressed in the curriculum? How to develop a cross-curricular approach to global change education?

These two questions are at the heart of V-Global project (Erasmus Plus Program 2021-1-FR01-KA220-HED-000023242).

To answer these questions, we interviewed 25 higher education teachers from different European countries (France, Germany, Greece, Spain, Portugal, UK). We analyzed the geography curriculum of four universities: Universität Hamburg, UNED, National Technical University of Athens; Université Paris Cité. These cross-analyses have made it possible to highlight the diversity of ways of integrating global change into the curriculum and teaching practices. These analyses also show that the place for ESD is uncertain. We will conclude this presentation on possible strategies for developing a global change curriculum at the university.

GEOLAND: Digital Educational Geoinformatic Methodologies for Monitoring Landscape *Luc Zwartjes, Christos Polykretis, Dimitris Alexakis, Karl Donert*

Landscape is both a physical reality and the representation that we make of it. It is the face of a land with all its natural and anthropological elements and, at the same time, the feelings and emotions that it arouses in us when we see it. Therefor the European Landscape Convention indicates that assessment of all these different dimensions that exist in landscapes should be considered by public authorities while adopting policies and measures at local, regional, national and international level for protecting, managing and planning landscapes throughout Europe.

With this situation in mind, GEOLAND – an Erasmus+ KA2 Higher Education project - focuses on NATURA 2000 sites, with as goal to establish a learning path for the HE students and professors in order to apply their geospatial analysis knowledge in Landscape monitoring and protection, using digital skills like public participation GIS, and low-cost geoinformatic. In particular the main aim of the project is to develop a web based GIS platform where numerous geospatial data may be uploaded, analyzed and students' opinion about landscape will be asked through questionnaires and crowdsourcing.

The project will thus provide the opportunity to students and professors, being interested in definition and implementation of landscape policies, to play an active part in setting sustainability indicators of desirable landscape quality objectives (LQOs). In addition, GEOLAND will attempt to train the future employees to identify and summarize the environmental and cultural stratification in the examined landscapes through a sophisticated GIS oriented Landscape Character Assessment (LCA) methodology. . In this direction, the project will develop a new methodological framework for monitoring Landscape tailored to the needs of the new digital era, safeguarding thus the inclusive nature of learning opportunities. Moreover, the project will provide training content matching the digital education needs.

Geolocation and Bio-Maps to stimulate the teaching of Spanish literature

Marta Saracho Arnáiz

This paper presents a teaching-learning experience resulting from the transfer of the *Bio-Maps Cartoteca de Autores Europeos* project (2020-2023) to improve the learning of literature in higher education. The Bio-Maps project is based on the interdisciplinarity between literature, history and geography, also using storytelling and geo-information technologies. Taking advantage of the know-how of the project and its methodology and also adding the principles of experiential learning, we proposed to a class of Spanish Literature of the higher education of the Escola Superior de Educação de Oporto (ESE IPP, Portugal) of the degree of Languages and Foreign Cultures, the elaboration of a Bio-Map. The students created in pairs a mapped biography of Spanish women writers of the 20th century on the

Arc-Gis platform. The experiment aimed to demonstrate that the use of active learning methodologies with a multidisciplinary approach, including geolocation in the cloud, and through innovative digital technology, can improve the learning of literature. The Arc-GIS Story-Maps application applied to the teaching-learning of Spanish literature was very motivating for the students, it activated their creativity and collaborative work. The result was a digital product with authorship by each group and the feeling of empowerment.

Teaching the future and learning climate change with ArcGIS Dashboard

Rafael de Miguel González, Juan Mar Beguería

Teach The Future (TTF) is an European Union funded project, coordinated by EUROGEO, and designed to promote a highly relevant educational approach to climate change education, by applying open science and open data principles to the framework of a digital citizenship educational paradigm. he project responds to the needs of Europe and the goals of Agenda 2030 concerning sustainability and climate action.

TTF's has produced an analysis of curriculum across partners and the potential for teaching the future, climate education and using open data. Later on, teaching tghe future has created an online climate data dashboard, as a teaching resource targeted at teachers. This gathers climate data and scientific information which can be used by schools to support learning and teaching climate in schools. TTF's ArcgGIS Dashboard provides opportunities in and beyond the classroom, developed from an analysis of the resources and opportunities available, but also allows to develop an online teacher training course and to implement a quantitative and qualitative reserach about the challenges of climate change education in secondary education.

Posters

The use of concept maps in geography education: a systematic review

Vanda Pivarníková

In contemporary geography education research, there is increasing talk about introducing new methods of assessment to aid the learning process. One such tool of assessment for learning is a concept map, which visually represents the structure of an individual's conceptual knowledge. These maps, made up of concepts linked by verbs into propositions, are mainly used for their ability to support and develop meaningful learning (Machado & Carvalho, 2020).

In this poster, I present the results of a systematic review that aimed to map studies in the field of geography education that use concept maps. The review works with 25 empirical studies published between 2003 and 2023, written in English and searchable in Scopus, WoS and ERIC. I chose two major criteria for their inclusion: 1) the maps had to be created directly by students or teachers, and 2) the topics had to be related to the content of the geography curriculum. In the analysis of the texts, I focused primarily on the research design and research objectives, the purpose and analysis of the concept maps, the teaching context (interventions, themes), participants and results.

Results show that most of the studies used concept maps as a tool to reveal conceptual changes in students´ and teachers´ understanding after an intervention. The most common themes for the development of the concept maps were climate change and examples from human-environment interactions that require complex, critical and systematic thinking. The process of creating a concept map (concept mapping), which some authors believe to be more important for students than the final products themselves (Cañas et al., 2017), is not addressed in any of the studies in the research set. Therefore, concept maps are most commonly used as a summative assessment tool, while they also demonstrate a potential for formative assessment.

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Navigating the Skies: Drone Innovation, Offshore Energy, and Compromised Geography in the North Sea

Michiel De Meyere

It becomes clearer that drone innovation and offshore energy converge, forming a significant aspect of the EU's energy competence. The number of beneficial applications of drones within our society is increasing. The European project DIOL (Develop Innovative Offshore Logistics) supports the vision of transforming the North Sea into the Green Power Plant of Europe, as set out in the Esbjerg and Ostend Declarations. We hold the belief that a system of multiple interconnected offshore energy projects in the North Sea can only be achieved through collaboration beyond borders. To accomplish this, mutual learning and understanding between Belgian and other airspaces regarding the complex airspace of the North Sea is needed. Insights about the North Sea airspace such as the status of the implementation of the U-space framework, and the geo-zone that will be better organized to welcome and facilitate drone operations is needed. Long-distance drone flights over the North Sea (BVLOS UAS operations) can be an added value for offshore wind energy. To achieve this, airspace optimization and an EU-wide operational framework is needed.

Professional Development of Geography Teachers: A Review Study

Gabriela Kostová

Teacher professional development is crucial for any teaching career. Schleicher (2020) highlights the significance of lifelong professional development for teachers. This is because their initial training cannot be considered the pinnacle due to the rapid changes in society. Hattie's (2012) meta-analysis reports a significant impact of teachers' professional development on students' academic achievement. Schell, Roth, and Mohan (2013) discuss the necessity of researching geography teacher development. While quality criteria have been established by research (e.g. Höhnle, Fögele, Mehren, Schubert 2016), it is unclear whether the professional development courses for teachers, as they are designed and provided, meet these criteria.

The purpose of this paper is to present the findings of a review study that focuses on professional development for geography teachers. The aim is to provide an overview of the current state of knowledge in this area. This review study is part of the author's dissertation, which specifically addresses the quality criteria of professional development for geography teachers and its subsequent application in in-service teacher education courses.

Research studies were searched in the SCOPUS and WoS databases using keywords such as 'professional development', 'teacher professional learning', 'geography teacher' and 'in-service teacher'. Over 20 studies were analysed, with a focus on their objectives, methods, and results. The findings of the review study will be presented at the conference.

Examining Effectiveness of Food Hospitality Business COVID-19 Survival Strategies Across Southwestern Ontario, Canada

Alexander Morgenthaler, Alexander Wray, Shiran Zhong, Godwin Arku, Jinhyung Lee, Sean Doherty, Jason Gilliland

Food hospitality businesses implemented various strategies to become more resilient to pandemic-related restrictions and changing consumer demands, including delivery, curbside pick-up, outdoor patios, and alternative business models (e.g., adding retail to the hospitality). The effectiveness of these strategies is not known. A logistic regression model was developed to test how these operational resilience strategies and neighbourhood-level sociodemographic factors affected business survival from March to June 2020 across Southwestern Ontario. Curbside and delivery combined proved to be the most effective strategy for keeping businesses open followed by curbside alone and drive-thru options respectively while patios proved to have limited effects on survival. Additionally, the businesses that stayed open were located in more urbanized areas as compared to rural and remote areas, highlighting a clear spatial divide. The use of a mixture of operational strategies built resilience to changing consumer demands and shifting pandemic-related restrictions, thereby resulting in greater survival among businesses that were willing to adapt their operations.

Methodological Aspects of Creating Geodata for the Historical Landscape of Southern Georgia

Roman Maisuradze, Tamar Khardziani, Gia Chilingarashvili

One of the branches of landscape research is the study of historical landscapes, which is also our subject of interest. The study concerns Samtskhe-Javakheti, one of Georgia's regions known for its landscape diversity, historical-cultural heritage, and the spread of archaeological-architectural monuments. Our research included field studies, the use of GIS technologies, and the application of traditional and modern methods, collecting information on the landscape, historiographical, and archaeological content, reviewing various sources, and analyzing the geographical space - at the level of landscape units. The paper analyses the allocation and aggregation of historical-cultural elements of the landscape and their spatial overlap with natural ecosystems. Our presentation emphasizes the methodological aspects and the following thematic information within the framework of geographical approaches and landscape research: 1. Geological; 2. Geomorphological; 3. Climatic; 4. ecosystem; 4. distribution of the land fund; 6. Urban; 7. Historiographical; 8. Archaeological; 9. Extraction, collection, combination, and analysis of architectural content from various sources (field, cartographic, literary, archival, online). As a result, we analyzed the distribution of megalithic and rock-cut structures, prepared geodata, correlated their distribution with natural features of landscapes, and created maps.

Mapping Inequalities: Unveiling Socio-Spatial Divides in Medium Size Cities: Ciudad Real (Spain)

María Angeles Rodriguez Domenech

This study explores the nuances of compromised geography and its implications for spreading a new world, particularly focusing on the phenomena of residential segregation and social inequality within medium-sized urban landscapes, exemplified through Ciudad Real. This city has witnessed a dramatic transformation over recent years, marked by notable expansion alongside escalating urban segregation and social disparities. To dissect these dynamics, this study primarily harnesses secondary statistical data sourced from the National Institute of Statistics (INE).

By integrating socio-economic datasets within a Geographic Information System (GIS), the research conducts a thorough examination of the spatial distribution and interrelations among various indicators. This methodological approach facilitates a comprehensive visualization and analysis of the data, enabling the utilization of the Pearson correlation coefficient to assess the degree of association among variable pairs. Such analytical processes are instrumental in uncovering patterns of association across different neighborhoods within Ciudad Real's capital, thereby illuminating the socio-spatial fabric of the city.

The findings reveal pronounced socio-spatial discrepancies, highlighting the concentration of distinct demographic groups within specific city zones. These range from communities with lower income levels to those boasting higher income brackets and educational attainments. The study underscores the critical necessity for adopting an all-encompassing perspective in tackling socio-spatial inequalities, thus contributing to the discourse on compromised geography and the envisioning of a new world paradigm that prioritizes inclusivity and equity in urban development.

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Three decades after the political transformation in Poland - an attempt at demographic typology in settlements characterized by socialized agriculture.

Marta Gwiaździńska-Goraj, Monika Wesołowska, Aleksandra Jezierska-Thöle

The article presents reflections resulting from detailed research conducted in specific, different localities in Poland where socialized farms (State Farms) operated after World War II. 1,666 such settlements were accepted for the study. Their establishment was related to the ""socialist"" reconstruction of the economy. Socialized farms were established primarily in northern and western Poland and are the result of a confluence of various conditions:

 • the demarcation of Poland's new borders after World War II, which received northern and western lands under the Potsdam provisions,

 • the mass exodus of the German population from the areas annexed to Poland,

 • actions to develop agricultural land from abandoned post-German estates.

 The appearance of State Agricultural Farms in the mentioned areas, their operation significantly affected not only the form and structure of land use, transitional development, but also the professional and demographic structure of the population. These areas have significantly rejuvenated the population structure, but due to the lack of rooting in new residents for many decades, specific demographic processes (gender imbalance, aging of the population, selective migration), different from the rest of Poland, have been observed in these areas. In addition, these settlements, due to the lack of a strong connection of people living in them with the area, migration related to the lack of development prospects, are called demographic and social deserts.

 The main objective of the presented research is to analyze the demographic changes taking place in the so-called ""post-statehood"" settlements. The authors posed 4 research questions:

 • In what direction did the population changes occur? What are their spatial dynamics?

 • How did the changes in population numbers affect the structure of the population by sex and age ?

 • can areas with similar demographic processes be separated ?

 • What demographic and social problems are emerging in these settlements?

 For the purpose of the article, the authors carried out a classification of the studied localities, taking into account their differentiation with regard to the organizational form of farms. Then, after a detailed analysis of demographic changes, they made an attempt at demographic typology of the analyzed spatial units.

In the analysis performed, cartographic and statistical methods, typical of the scientific approach in describing quantitative phenomena, differentiated in the studied geographical space, were widely used. The time caesuras of the study include the years 1960-2021, they were determined on the basis of the availability of a consistent catalog of statistical data for the analyzed units, allowing a comprehensive analysis to be carried out while maintaining the comparability of the results obtained in the specified time frame. The source of data for the analyses were the unpublished resources of public statistics of the Central Statistical Office in Poland, made available to the authors for the purposes of the study.

The research proceedings carried out, the answers to the questions posed, the conclusions constructed, can help planners and representatives of local governments in implementing dedicated social policies in areas that three decades ago were characterized by the presence of a socialized economy, and now face many demographic and social problems.

Which elements of the residential areas' aesthetics are important to older people?

Agnieszka Dawidowicz, Małgorzata Dudzińska, Marta Czaplicka, Adam Senetra

Identifying the needs of older people is the basis for the development of aesthetically pleasing functional and spatial arrangements of public open spaces in residential areas that meet their expectations, i.e. age-friendly residential areas (AFRAs). The aim of the study was to establish the needs of senior citizens in terms of the aesthetic quality of AFRA development. As a result, four groups of landscape factors, including 13 elementary factors, were selected and ranked for AFRA.

The Impact of Socioeconomic Changes on Risk Prioritization in European Travel: A Case Study

Małgorzata Dudzińska, Marta Gross, Agnieszka Dawidowicz, Ada Wolny-Kucińska

Pandemics, political instability, economic crises, and conflicts significantly impact the lives of millions, disrupting economic and social stability while shaping travel behavior (TB). Understanding these influences is crucial for developing sustainable transport systems, aligning with Agenda 2030's focus on mobility within the context of sustainable development. Despite this importance, there is a scarcity of research on threats to TB, especially those resulting from changes in socioeconomic factors in functional urban areas (FUAs). This study addresses this gap by investigating how the COVID-19 pandemic and the energy crisis in Europe have altered the prioritization of threats to TB. Through literature analysis, a comprehensive threat classification, and an expert survey, we identified 46 factors grouped into six categories: social, economic, legal, infrastructural, technological/SMART, and environmental. Our study compares the significance, similarities, and differences in threat

prioritization during the COVID-19 pandemic and the energy crisis post the outbreak of the military conflict in Ukraine across 22 European countries.

The initial training of the geography teacher in the Romanian pre-university education system

Laura Comănescu, Alexandru Nedelea

The initial training for the teaching profession has undergone fluctuations within brief time intervals, depending on legislative changes. Currently, in the Romanian pre-university education system, there are teachers with different initial training, namely: graduates of the psycho-pedagogical module in postgraduate or simultaneous courses with a duration of three years in the field of Geography, graduates of university studies in the field of Geography with a duration of three years and a Didactic Master's degree with a duration of two years (Education Law 1/2011, Methodology for the establishment and organization of didactic master's programs, approved by Order no. 4524/2020, Higher Education Law 199/2023), and graduates of long-term university education (four to five years) who have simultaneously completed psycho-pedagogical and teaching training courses, either mandatory or optional.

The aim of this paper is to highlight the role of initial training for geography teachers in the pre-university education system, as well as the competencies they need to have (professional, psycho-pedagogical, methodical and teaching, communication, and digital).

The research methods used for this study were interviews (conducted with university teachers who teach courses for teaching training in the field of geography) and questionnaires (voluntarily completed by geography teachers with different types of initial training). The questionnaire was structured into three parts (data on initial training; elements regarding the competencies that geography teachers must possess; data on the teacher's professional activity and continuous training), to which is added the respondent's identification sheet. It comprised a total of 15 items, mostly multiple-choice, with 10 interviews and over 100 questionnaires being conducted, which were subsequently analyzed and statistically processed. The results highlighted the superiority of training based on long-term studies, combined with compulsory or optional psycho-pedagogical / teaching training, as well as the importance of teaching and digital competencies in the current period.

The findings of this analysis are preliminary, and additional research will be undertaken regarding the topic of ongoing professional development for geography teachers and the role of geography in the Romanian pre-university curriculum. The limitations of the study lie in the frequent legislative changes that affect the way initial training is conducted, leading to a lack of coherent educational policies that would allow for the validation of the results.

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Methodology for the establishment and organization of didactic master's programs, approved by Order no. 4524/2020, Higher Education Law 199/2023

The development of geotourism in the Călimani Mountains (Eastern Carpathians, Romania)

Alexandru Nedelea, Laura Comănescu, Andrei Vodă

The aim of this study is to inventory and evaluate the most representative geomorphosites in the Călimani Mountains and, based on the obtained results, to introduce them into geotourism activities by creating and implementing three new geotourism routes.

The assessment was carried out with the help of Pralong's method, which focuses on the tourist value of geomorphosites (Comănescu, Nedelea, 2010), calculated as the arithmetic average of following values: scientific (palaeogeographical interest, representativeness, surface, integrity, state of preservation, singularity, ecological interest, the presence of study points), aesthetic (number of belvedere points, average distance from belvedere points, impact of colour against the surroundings, altitude and climbing effort, shape, location in the landscape), cultural (cultural legacy, presented in iconographic representations or in different writings, historical and archaeological relevance, religious and symbolic relevance, artistic and cultural events) and economic values (accessibility, attractiveness, annual number of visitors, official protection level, inclusion in promotional materials, natural risks). The values for each sub-criterion are between 0 and 1.

The area selected for the study, the Călimani Mountains, is located in the north-western part of the Central Group of the Eastern Carpathians, constituting a segment of their western volcanic chain, formed as a result of volcanic eruptions that occurred in the Neogene. The maximum altitude is 2100 m at the Pietrosul Peak. The genetic types of relief (volcanic, periglacial, volcanic-karst, and fluvial) and complex geology have led to the emergence of numerous geomorphosites (Vodă- Marc, 2010). Out of these, a total of 15 geomorphosites, differing in genesis, complexity, and representativeness, were selected, inventoried, and evaluated. By applying the evaluation method, the highest tourist value was obtained for the Twelve Apostoli geomorphosite (0.76), while the lowest was for the Repedea Valley (0.34).

Based on the obtained values, the following geotourism routes were created and analyzed (using the accessibility map and geomorphological profiles) (Naum, Butnaru, 1989): Twelve Apostoli - Poiana Izvoarele - Retitiş Peak - Iezerul Călimanilor Peak - Iezerul Călimanilor Lake Basin; Poiana Izvoarelor - Pietrosul Călimani Peak - Reţitiş Peak - Iezerul Călimani Peak - Păltiniş Pass; Petricel Peak - Sulfur Exploitation - Izvorul Călimanului- Iezerul Călimanilor Lake Basin - Lomășiţa Waterfall.

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Around my schoolyard in 8 steps

Ana Cristina Câmara

The project "Around my schoolyard in 8 steps" was funded by the Ciência Viva program and implemented in some schools in the country, but it requires, for full implementation and continuity, a transdisciplinary training, based on the geographical study of the local environment, through the conceptualization and execution of didactic projects, based on the schoolyard or the nearest park. and about which 8 steps will be "given": observation, collection, measurement, tactile perception, registration, representation, organization and reporting, providing a first contact with the scientific method.

The Hazardous Climatic Phenomena: Bulgarian Dimensions

Zoya Mateeva

The climate is a source of a number of valuable resources, but at the same time, climatic conditions can in many cases hinder the implementation of human activity and even endanger it. At present, there is more talk about climate hazards, which are increasingly taking precedence over climate resources. According to the EEA, between 1980 and 2022, weather- and climate-related extremes caused economic losses of assets estimated at EUR 650 billion in the EU Member States. Some statistical analysis has revealed that economic losses increase over time, and as severe weather- and climate-related extreme events are expected to intensify further, it seems unlikely that the associated economic losses will reduce by 2030. However, they have different dimensions in a territorial aspect, depending on many different factors, of which the frequency and intensity of the occurrence of dangerous weather phenomena are especially important. This determines the need for regional research and parameterization of these phenomena.

The present research aims to identify and describe the hazardous climate phenomena on the territory of Bulgaria. For this purpose, the climatic record of the last few decades of four groups of climatic hazards is followed:

1) Hazards related to thermal conditions;

2) Hazards related to humidity, precipitation conditions and dry periods;

3) Wind-related hazards;

4) Air pollution hazards.

The first group includes heat waves, as well as colds and frosts. Heavy and intense precipitation, hail and thunderstorms, ice and snow events, fogs and droughts are tracked in the second group. The third group pays attention to strong winds, windless weather and whirlwinds. The fourth group concerns climatic parameters whose complex effect contributes to the atmosphere's ability to retain pollutants.

The results of the study of these dangerous climatic phenomena in Bulgaria are important for the planning and climatic adaptation of a number of economic activities in the country - healthcare, agriculture and forestry, water sector, energy sector, transport, tourism, urban environment, etc. In addition, these results complement the regional information base and contribute to the comparative analysis at European and global level, and the formation of relevant policies, strategies and action plans.

Workshop 1.

The Cost of the Energy Transition: Vision and Debate among University Students

Maria Angeles Rodriguez Domenech, Juan Antonio García Gonzalez

The energy transition is essential but costly, and will require coordinated efforts, equitable policies and technological advances to be successful and sustainable. How do university students perceive the cost of the energy transition? University students have mixed views, with a mixture of recognition of the importance and concern about the associated costs.
At the Glasgow Conference (2021), the world set an ambitious goal: to slow climate change by reducing net greenhouse gas emissions to zero by mid-century. This energy transition, while essential, raises a critical question: How much are we willing to pay to ""save the planet""? The present energy crisis is arguably a prelude to the costs and challenges ahead.
This study focuses on the university perspective on the cost of the energy transition. Specific objectives include: To explore university students' perceptions of the cost of the energy transition and to determine willingness to pay for decarbonisation and to understand the factors influencing this willingness.

A semi-quantitative approach was employed using a survey distributed to a representative sample of university students. The survey included questions on the perceived cost of the energy transition, willingness to pay.

The results indicate that, although there is widespread recognition of the importance of the energy transition, there is significant variability in the willingness to pay for it. Factors such as environmental awareness, economic status and expectations of political effectiveness played a crucial role in these differences.
The study revealed diverging views among different university groups. While some students are willing to incur significant costs, others are more sceptical about the effectiveness and fairness of the financial burden.

References:

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Workshop 2.

Teachers in outdoor learning: role definitions and role perceptions

Nati Kranot

Many educational goals are attached to outdoor learning, especially to long out of class experiences such as educational tours or school fieldtrips. Besides the obvious curricular goals (learning Geography, sciences, history etc.), there are social goals (working together, being a part of a group), personal goals (meeting challenges, going outside of the convenience zone) and civic education (such as environmental behavior)/

Teacher are the key factors and the main actors in the educational arena. As such, their actions, role definitions perceived roles should be examined in the context of the outdoor experiences as well.

The workshop is based on my PhD, which has studied teachers' actions and role perceptions in the Israeli annual fieldtrip. It is also a part of an on-going international comparative research, on which I try to observe and define similarities and differences between teachers from different countries in outdoor experiences.

The workshop includes a metaphor analysis session, in which the participants will share and discuss their representations of teachers in general, and more specifically, of their metaphors for teachers within the outdoor arena. Metaphor analysis has been found to be an intriguing method to explore ideas, thoughts and perceptions. They enable us to broaden our understanding of social-cultural nuances and characterizing relationships and concepts.

This workshop might emphasize the importance of teachers in fulfilling the goals of Geographical Education in the field, especially in a digital era of information flooding.

Workshop 3.

Why Europe is a MUST!

Harry Rogge

With the help of two maps the European concept will be explained. Focus on two European institutions the European Union and the Council of Europe. Presenter of poster is an official delegate to the Council of Europe on behalf of EUROGEO for years. Getting to know and understand the European values is main target!

Workshop 4.

GEOBSERVE - an online platform to develop Teacher's Spatial Skills for Climate Change and Sustainable Development Education

Gustavo Rojas

Teaching about climate change and sustainable development poses significant challenges for educators, demanding the integration of scientific knowledge with green, digital, and spatial competencies. Research indicates that many teachers lack the necessary knowledge and skills to access, analyze, and effectively communicate climate change data, including the use of Earth Observation imagery and GIS technologies. Available training opportunities often fail to meet teachers' needs, as they are not tailored to their schedules or curricular demands, rely on outdated pedagogical models, or employ obsolete technologies. It is therefore crucial to address these issues and provide teachers with the tools and knowledge they need.

GEO-Academy (https://geoacademy.eu/) is a three-year Erasmus+ Teacher Academy aiming to establish a European network of educators and provide a comprehensive training and development program for teachers by using an effective pedagogical approach. Namely, GEO-Academy relies on a blended competence-based network, which uses innovative geospatial technologies and modern pedagogical methodologies to teach sustainable development topics. GEO-Academy will therefore work together to develop teaching materials and training resources, and to establish GEO-Hubs that will connect teachers across Europe, coordinated at a national level, in order to educate the next generation of European citizens on sustainability and support teachers in their learning and teaching.

One of the main features developed within the project is GEOBSERVE, GEO-Academy's central hub for teacher training, available for free and accessible everywhere. The platform will host trainings and materials, including specially selected tools for teachers as well as resources and guides to support implementation in the classroom, and it will be available in June 2024.

In this workshop, we will present the key features of GEOBSERVE and how the registrants can benefit. Participants will be guided through the registration process and shown the many opportunities to engage through example materials, including the option to add tools and resources and create discussion forums where they can interact with fellow teachers, as well as training courses available on different topics. Finally, the participants will be presented with an opportunity to collaborate with GEO-Academy through national GEO-Hubs with their school/students, for which the participation process and benefits will be explained.

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Conference Publication Options

Presenters at the EUROGEO Conference are invited to send their contributions according with relevant publication rules to the EUROGEO Journal or the EUROGEO Book Series:

1. European Journal of Geography, http://www.eurogeographyjournal.eu/ (Instructions for authors: http://eurogeographyjournal.eu/index.php?func=page&page_id=45) (Indexed in Scopus, Scimago Journal & Country Rank Q1).

2. Springer – EUROGEO book series: **Compromised geography**. Call for chapters will be anounced soon. SCOPUS and Web of Science.