International Geographical Union's Commission of Geographical Education's Conference

'Geographical Learning Today for Tomorrow'

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Stellenbosch,
South Africa
28-30 October 2025

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GLEN CARLOU

Dear Delegates, Colleagues, and Friends,

It is my great pleasure and privilege to welcome you to this year's IGU Commission on Geographical Education Conference. On behalf of the local organising committee, I extend a warm and sincere welcome to all participants — educators, researchers, students, policymakers, and stakeholders — who have joined us in the shared commitment to advancing geographical knowledge, pedagogy, and practice.

This conference takes place at a time when geographical education plays a crucial role in equipping learners with the skills and understanding necessary to navigate an increasingly complex and interconnected world. From climate change and urbanisation to spatial justice and digital mapping, geography remains central to addressing global challenges through informed, place-based perspectives. The abstracts compiled in this booklet reflect the diversity and depth of current research and innovation in the field. We hope they will inspire robust discussions, meaningful collaborations, and transformative ideas.

We are deeply grateful to our generous sponsors, whose support has made this event possible. Your contributions underscore a shared investment in the future of geographical education and scholarship.

A special note of appreciation must also go to the local organising committee, whose dedication, professionalism, and tireless work behind the scenes have ensured the successful planning and execution of this conference. Your efforts have not gone unnoticed, and we thank you wholeheartedly.

As Chairperson, I encourage you to engage fully with the programme — attend sessions, ask questions, share your insights, and connect with colleagues. Let this conference be not only a platform for academic exchange, but also a space for renewing our collective passion for geography education. Additionally, please consider submitting your original manuscripts to the *Journal of Geography Education in Africa* (JoGEA) for consideration towards publication – see: https://upjournals.up.ac.za/index.php/jogea.

Wishing you a productive, stimulating, and enjoyable conference.

Yours in Geography Education,
Prof. Clinton David van der Merwe
Chairperson, CGE African Representative
University of Pretoria
South Africa

UNIVERSITEIT VAN PRETORIA
UNIVERSITY OF PRETORIA
YUNIBESITHI YA PRETORIA

Local Organising Committee:
Prof. Di Wilmot (RU); Dr Paul Goldschagg (WSoE); Prof. Mary Evans (Wits); Dr Muofhe Thenga (WSoE); Mr Graham Keats; Mrs Bridget Fleming; Ms Tess Uren; Mrs Amanda Louw and Prof. Sadhana Manik (UKZN).

PROGRAMME

Pre-conference Monday 27 October			
07:30-17:00	Pre-conference optional field trip to Hermanus (**fully booked**) – meet at STIAS from 7:00		
18:00-20:00	Welcome function, pre-registration, and cocktail event at STIAS		
Day 1 – Tuesday 28 October			
07:30-08:30	Registration		
08:30-08:45	Opening and Housekeeping: Clinton van der Merwe		
08:45-09:05	Welcome Address: Martin Hanus & Gillian Kidman		
09:05-10:15	**Plenary 1: Keynote: Prof. Heila Lotz-Sisitka (Rhodes University)** 'T-learning in Times of Climate Change: Implications for curriculum, pedagogy and assessment'.		
10:15-10:35	**TEA BREAK**		
	Auditorium 1 – Chair: ***Sadhana Manik***		Auditorium 2 – Chair: ***Graham Keats***
10:35-10:55	**Anne Chawanda, Megan O'Meara, Amyleigh Tolmay, Lwandile Shelembe, Kiara Joannides, Julia Veale** Redecorating our geography classrooms with augmented reality (AR)		**Mary Evans, Ruby-Anne Birin, Jasper Knight** Re-imagining the past: Using AI-powered visualisation in the Geography classroom
11:00-11:20	**Daniela Schmeinck** Fostering Responsible Consumer Behaviour: Insights from the Re3PriS Project on Sustainable Consumption Education		**Paul Goldschagg, Di Wilmot** A scoping review of geography education research in South Africa, 2014-2024
11:25-11:45	**Krystle Ontong** Fostering ethical competence amongst geography students through an interdisciplinary approach		**Martin Hanus, Lenka Krajňáková, Martin Kutiš, Dana Řezníčková, David Trokšiar, Veronika Bernhäuserová** MapStrApp: A Digital Tool for Developing Map Use Strategies in Secondary Schools

11:50-12:10	**Muofhe Thenga** The effects of microteaching on pre-service teachers' self-efficacy in teaching mapwork		**Sophie Wilson, GIS-T Erasmus+ partners** GIS-T: Teaching about Climate change with the help of Geographic Information Systems (GIS)
12:15-12:35	**Carla Hermanussen** Decolonising Climate Change Education: Perspectives from Kalimantan		**Xin Miao, Yushan Duan** Enhancing geography undergraduates' spatial thinking capabilities with Multimodal Large Language Models (MLLMs): A Mixed-Methods Approach
12:40-13:00	**Liu Haonan, Han Jiaqiang, Zhou Xinghua** Design for Interdisciplinary Thematic Learning in Geography to Cultivate Scientific Spirit: Values, Principles, and Pathways		**Emmanuel Eze, Rainer Mehren** Smartphone-Integrated Geomedia for Transformative Climate Education in Nigeria, Uganda and South Africa: A pilot study
13:05-14:05	**LUNCH**		
	Auditorium 1 – Chair: ***Di Wilmot***		Auditorium 2 – Chair: ***Sarfaraz Alam***
14:05-14:25	**Iara Rosa da Silva Bustos, Vinícius da Matta, Izilda Makibara, Thaís Martin, Michael Santos e Gisa Gasparotto** Learning Geography: interdisciplinary educational practices of creativity and metacognition		**Shaylen Naidoo** The Neoliberal Framing of Economic Geography in FET CAPS: Perpetuating South Africa's Role as a Primary Commodity Exporter?
14:30-14:50	**Dong Haowei, Zhao Chao** Expressive Evaluation for Promoting Deep Learning — Taking the Wenyu River Project Research as an Example		**Jacobus Minnie, Clinton van der Merwe** An analysis of the teachability of synoptic weather maps in Grade 12 textbooks.
14:55-15:15	**Pamela Esterhuysen, Clinton van der Merwe** Value of place-based fieldwork in the local environment		**Gema Sánchez-Emeterio, Honrubia Montesinos, Cristina, García-Monteagudo, Diego** Artificial Intelligence and Geography Education: Enhancing Geographical Thinking and Water Awareness in Primary Education
15:20-15:40	**Thandiwe Chidzungu, Thea Schoeman** The educator content, pedagogical and technological knowledge competency integration gap in map skills: Evidence from the University of Johannesburg's in-service teacher training program in Gauteng, South Africa.		**Rainer Mehren** A model for teaching quality in geography lessons
15:40-16.00	**POSTER SESSION & NETWORKING**		
16.00-16:15	**TEA BREAK**		
16:20-18:00	**Panel Discussion in Auditorium 1** **Chair: Martin Hanus Panellists: Di Wilmot, Robert Bednarz, Gillian Kidman, Tomáš Bendl, Lenka Krajňáková, Johanna Mäsgen** Rethinking Praxis for a World of Difference: Findings and Reflections from the 2024 CGE Writing Retreat		

Day 2 – Wednesday 29 October

	Auditorium 1 – Chair: ***Paul Goldschagg***		Auditorium 2 – Chair: ***Sarfaraz Alam***
08:30-08:50	**Krystle Ontong, Koketso Khule** Enhancing Oracy Skills in Geography Education: Strategies for Effective Communication and Deeper Learning		**Veronika Selbach, Johanna Mäsgen** Fostering global citizenship and environmental stewardship with assisted reality
08:55-09:15	**Melissa Meurel** Geography Teachers' Interest in Professional Development		**Jakub Matula, Michaela Spurná** Geographical giftedness: A systematic review
09:20-09:40	**Thoko Poppy Mahlangu** Teaching and Learning Methods in Geography: The voices of experts towards innovative teaching and learning		**Nerhene Davis, Serena Coetzee, Christiaan Struwig, Hlamarisa Ndhlovu** Exploring Sense of Place through a Blended Learning Approach: Lessons and Insights
09:45-10:05	**Mengyuan Lu** Organisational Sensemaking in the Implementation of Geography Achievement Standards		**Neo Moruthane** A Transformative Geographical and Environmental education that equips citizens: Effective strategies for promoting a resilient and Sustainable education for Today and Tomorrow
10:05-10:35	**POSTER SESSION & TEA BREAK**		
10:40-11:00	**Lenka Krajňáková, Martin Hanus, Tomáš Bendl, Miroslav Marada, Oldřich Mokruša, Simona Pekárková** Developing a four-tier test for diagnosing conceptual understanding in pupils of different age groups		**Jing Qian** Research on the Implementation of Dual Carbon Education Integration in High School Geography Curriculum in China
11:05-11:25	**Yushan Duan, Hermione Xin Miao** Transforming Geography Education through Textbook Innovation: The Shanghai Model		**Jerry Mitchell** Success in Geography Education: Efforts at Work Across the Globe
11:30-11:50	**Shaylen Naidoo** Exploring Non-Representational Theory in the South African Geography Further Education and Training Phase Curriculum and Assessment Policy Statement		**Jayeon Yang, Martin Hanus, Emma Rawlings Smith, Uwe Krause, Milton Milaras, Tine Béneker, Radka Flajšhans Nedbalova, Xueying He, Yujing He, Naoyuki Ito** The barriers and enablers of curriculum thinking and teacher agency in geography education: A multinational study
11:55-12:15	**Tiani Wepener** Utilising Grade 4 Learners' Lived Experiences to Explore Places Where People Live		**Alan Felix** A content analysis of Virtual Field Trips in a Geography Higher Education classroom

12:20-12:40	**Oldřich Mokruša, Martin Hanus, Lenka Krajňáková** The effect of 3D models usage on students' conceptual understanding of contours		**Bridget Fleming, André Jacobs** Insights from SACE (South African Council of Educators) endorsement of a GIS course for educators and the need for a SACE-endorsed early learning spatial literacy professional development workshop
12:45-13:05	**Diego García Monteagudo, Gema Sánchez-Emeterio & Cristina Honrubia Montesinos** The Impact of Social Representations on Landscape Training in Future Early Childhood Education Teachers		**Cristina Honrubia-Montesinos, Diego García Monteagudo, Gema Sánchez-Emeterio** The Impact of Social Representations on Landscape Training in Future Early Childhood Education Teachers.
13:05-14:05	**LUNCH**		
	Auditorium 1 – Chair: ***Muofhe Thenga***		Auditorium 2 – Chair: ***Sadhana Manik***
14:10-14:30	**Jonas Wagener, Andreas Eberth** Transformative education in teacher training: The potential of field trips to foster reflexivity in addressing global inequality structures		**Angela C. Phocas, Clinton van der Merwe** Future-focused? Reflections on PBL Practices in Secondary School Geography Classrooms
14:35-14:55	**Péter Bagoly-Simó, Nikolaus von Schmettau, Ádám Tóth, Anett Kádár** Understanding Map Skills and their Development using Eye-Tracking		**Aubrey Golightly** Beyond the classroom: Geography teachers' motivation for and challenges in participation in self-directed professional development
15:00-15:20	**Luo Xiao, Chunlan Li, Yi Wang** Developing a Secondary School Cryosphere Science Literacy Curriculum: A Place-Based Education and Psychological Distance Approach		**Merle Biermann, Christiane Meyer** Water and our Common Future – Raising Awareness of Water Sustainability in Geography Education
15:20-15:50	**TEA BREAK**		
16:00-18:00	**WORKSHOP 1: Warren Boardman-Smith** "Conversations with maps": Teaching Visual Literacy in a Digital Age		**WORKSHOP 2: Robyn Mowatt, Pam Esterhuysen & Graham Keats** Mapping Assessment Practices: IEB ISC Exit-Level Assessment for Southern African Geography Secondary School Learners

Day 3 – Thursday 30 October

08:00 – 09:15	**IGU-CGE Steering Committee Meeting (Venue TBA)**		
	Auditorium 1 – Chair: ***Muofhe Thenga***		Auditorium 2 – Chair: ***Graham Keats***
08:30-08:50	**Gema Sánchez-Emeterio, García-Monteagudo, Diego; Honrubia Montesinos, Cristina** The Impact of Social Representations on Landscape Training in Future Early Childhood Education Teachers		**Arorisoe Sibanda, Heila Lotz-Sisitka, Wilma van Staden, John Bhurekeni, Shanu Misser, Rob O'Donoghue and Noncaba Khumalo** Curriculum-activated Change Project Approach for Climate Action and Sustainability Practice in School
08:55-09:15	**Rieke Ammoneit** Facing climate change in geography teacher education		**Johanna Mäsgen, Veronika Selbach** The potential of more-than-human geographies for transformative geographical learning
09:20-09:40	**Gillian Kidman, Hazel Tan** Geographies of Misinformation: Pedagogies for Navigating Fake News, Media Literacy, and Critical Thinking in Geographical Education		**Firuza Begham Mustafa** The Roles of Fieldwork in Modern Geography Education
09:45-10:05	**Tricia Seow** Nature Connectedness as an Alternative Discourse in Singapore's Climate Transition		**Erlend Eidsvik** Challenges in Sustainability Education: Powerful knowledge and powerful geography to the rescue?
10:05-10:35	**POSTER SESSION & TEA BREAK**		
10:40-11:00	**Sadhana Manik, Vibeke Vågenes, Nils Ekelund** Local Solutions to local problems: Engaging Global Partners for local Climate action and student activism		**Ditiro Leruele, Jabulani Sibanda, Tiani Wepener, Alan Felix** The impact of code switching on learners' participation and academic performance in a Grade 12 Geography class
11:05-11:25	**Sarfaraz Alam** Navigating a Fractured and Fragile Future: The Role of Geography Education in Times of Global Ecological and Political Turmoil		**Francois de Bruyn, James Gregory, Clinton van der Merwe** Coordinates of Success? Evaluating the School-to-University Geography Trajectory
11:30-11:50	**Matthew Ackerman** Geographical Learning: Telling the Story of Interdisciplinary Learning of Tomorrow, Today		**Minu Ahuja, K. Mamutse** An exploration of the challenges that pre-service primary school teachers face in geography in a South African institution
11:55-12:15	**Erlend Eidsvik** … and what about climate justice? Climate Justice Education in Space and Time: The cases of Norway and South Africa		**Sabelo Mtsweni** The Impact of English as a medium of instruction on teaching education for sustainable Development to English second language Geography learners.

12:20-12:40	**Nina Scholten, Nicole Masaneki & Isabel Höyng** Rethinking the origins of teaching expertise: Insight from expert Geography teachers in Germany		**Rafael de Miguel González** Integrating Geographical Competences in STEAM education and in training for Urban Sustainability
12:45-13:05	**Sophie Wilson, Sarah Bednarz, Fatima Munazza, Alfonso Garcia de la Vega, Regula Grob, Johanna Mäsgen, Di Wilmot** Is or can Transformative Learning be Embedded in Geography Textbooks?		**Mulalo Rabumbulu, Thea Schoeman** Linking the South African Geography School Curriculum with Education for Sustainable Development
13:05-14:05	**LUNCH**		
	Auditorium 1 – Chair: ***Paul Goldschagg***		Auditorium 2 – Chair: ***Bridget Fleming***
14:10-14:30	**Péter Bagoly-Simó, Michael Lehmann** From A to B (and beyond): Tracing Shifts in Geography Education's Take on Mobility		**Martin Hanus, Lenka Krajňáková, Tomáš Bendl, Miroslav Marada, Oldřich Mokruša, Simona Pekárková** A cross-age comparison of pupils' conceptual understanding of contour lines: Preliminary results
14:35-14:55	**IGU-CGE Business Meeting (Venue TBA) – All Delegates Welcome!**		
15:00-15:30	**TEA BREAK**		
15:35-17:25	**WORKSHOP 3: Gillian Kidman, Hazel Tan** AI in Geography Education: Navigating the Promise and Peril: A Critical Workshop for 21st-Century Geography Classrooms		**WORKSHOP 4: Sarah Witham Bednarz, Robert S. Bednarz** Spatial Thinking: Little Taught but Essential
17:30	**Meet at the bus and depart for the conference dinner**		
18:30-19:30	**Plenary 2: Keynote: Prof. Jonathan Jansen (Stellenbosch University) & Conference Dinner** Boring them to death: How South African schools destroy the prospects of deep learning in science (and geography) classrooms		

Posters

Location	TBA
1	**LiShiBao** Geographical Education Innovation on the Roof of the World: Construction of a Six-Dimensional Integrated Teaching Model Based on the Cordyceps Sinensis Harvesting Culture in Tibet
2	**Michaela Spurná, Petr Knecht** Teacher Educationists' Perception of Geography ITE Content Structure Inscribed in the Fibonacci Sequence
3	**Petr Knecht, Michaela Spurná, Karolína Malíková** Conceptions of Geography teaching: examining the ecological validity of the questionnaire
4	**JaYeon Yang** How does School Geography in South Korean textbooks conduct the ESD? Focusing on Textbook Analysis about "The Climate Change and Sustainable World"
5	**Julia Pahl** Are our Head Teachers okay? Decision-making processes of Head Teachers in COVID-19 times: Implications for head teachers and independent schools in South Africa.
6	**Iara Rosa da Silva Bustos, Gisa Gasparoto, Elisabete Feitoza** Literature and Environmental Science in Brazilian Literary Books in Basic Education
7	**Kudzayi Tarisayi** Enhancing self-directed learning in Geography Education through AI integration: An agentic capability perspective

Post-Conference – Friday, 31 Oct 2025

7.30 – 17.00 Post-conference optional field trip(s) in Stellenbosch

Abstracts

All abstracts are alphabetically ordered by surname, according to the corresponding author, in this book of abstracts

Geographical Learning: Telling the story of interdisciplinary learning of tomorrow, today

Matthew **Ackerman**

Geography functions as a distinct academic field uniting language, mathematics, science and chemistry under a unified educational framework. Students gain a complete understanding of the world through the integration of physical and human elements in Geography. The interdisciplinary educational approach serves as a vital foundation for teaching students about the developing world of tomorrow. The question remains: How should we educate students about a reality that has not emerged yet? Storytelling. The conversion of complex geographical concepts into narrative stories helps students develop creativity and enables them to see the world in three dimensions. Storytelling combined with digital media, virtual reality and AI tools enables the transformation of geographical phenomena into interactive experiences. Human ingenuity enables us to develop models and stories about our surroundings, functioning as educational instruments that connect present classroom learning to future possibilities. Storytelling helps students develop curiosity while building comprehension, unlike rote learning. Under storytelling, a teacher functions as a subject author. Telling stories that explain how the world operates. An approach that leads students to deeper involvement, thereby strengthening their ability to remember and use information after assessment periods. Geography is vital in helping students build their future careers and supports learning through multiple disciplines. Geography expands beyond content by integrating multiple learning methods, including semantic analysis, 3D mapping, mathematical principles and scientific theories and enabling students to view the world through multiple interconnected perspectives while developing their interest in learning. The Geography classroom of tomorrow is a blend of human creativity and advanced technology, turning static textbooks into immersive, dynamic experiences that prepare students for the future. Attendees will experience a journey -presentation- told as a story, using a creative blend of narrative writing, visual aids, videos, and live demonstrations of virtual reality and real-world mapping tools, offering a hands-on experience in interdisciplinary geographical learning.

An exploration of the challenges that pre-service primary school teachers face in Geography in a South African institution

M. **Ahuja**, K. Mamutse

Trainee primary school teachers in South Africa are expected to take geography as one of their major subjects. This is because geography is a compulsory subject located within the social science suite of primary and early high school subjects. The worst part is that geography is now very much linked to technology, such as geographic information systems and digital map work. However, students face several challenges that often lead to poor performance in the subject. In this qualitative study, the challenges are explored. The goal is to identify the loopholes that are causing problems for the students. The data is collected using semi-structured individual interviews and focus group interviews. The data is then analysed using content analysis. The study has established that student challenges are caused by insufficient exposure to geographical subject requirements, such as technology integration from primary school to high school. The study also established that important requirements like field trips are not appropriately met at the primary and high school levels. To that extent, upon their enrolment in higher education, the students would have a content deficit, which then affects their performance. The fear is that the student's professional growth will be tremendously affected if the issue is not immediately addressed. The conclusion is that there is a need to develop a more elaborate teacher training curriculum to ensure that upon their completion of training, the students would be ready to tackle all the demands of geography as a teacher. Keywords: Technical advancement, major subjects, compulsory, challenges, curriculum, training cycle of mediocrity.

Navigating a fractured and fragile future: The role of Geography Education in times of global ecological and political turmoil

Sarfaraz **Alam**

The contemporary world is becoming increasingly fragile and fractured, marked by the intensifying effects of hyper-nationalism, racial and cultural phobias, widening economic inequalities, inter-state conflicts, environmental degradation, and accelerating climate change. These interwoven crises pose profound threats to the sustainability of the planet and the very survival of human civilisation. In such a turbulent and uncertain global environment, geography—as both a discipline and a pedagogical practice—cannot afford to remain a passive bystander. With its deep-rooted tradition of critiquing dominant paradigms and envisioning alternative futures, geography has a unique and urgent role to play in helping individuals understand and respond to the complexities of the present world. In view of this, the paper contends that geography education must be reimagined in light of the ecological fragility and political disruptions that define our time. Drawing on theoretical perspectives of anarchist geography, the paper emphasises the need for a transformative approach in geography education that goes beyond mere content delivery, aiming instead to foster critical consciousness, global awareness with a strong focus on an ethic of planetary interconnectedness, solidarity, responsibility and care. It also argues that by critically examining the social, economic, and environmental processes that produce global political and ecological crises, geography education can empower students to engage meaningfully with those challenges and to become active participants in shaping an inclusive, just and sustainable future. Ultimately, the paper calls for a renewed commitment to geography education for nurturing informed, reflective, and compassionate global citizens capable of navigating and transforming an increasingly fragile and fractured world.

Facing climate change in geography teacher education

Rieke **Ammoneit**

Climate action is a common goal in geography education nowadays. Studies indicate that climate action is related to climate anxiety (e.g., [1]), a 'heightened emotional, mental or somatic distress in response to dangerous changes in the climate system'[2]. Climate anxiety is a healthy response to climate change, as opposed to apathy and denial [3]: the perception of climate-anxious people matches overwhelming scientific evidence [4]. Nonetheless, climate anxiety is a threat to young people's mental and physical well-being that can severely impact the individual's present and future life [5]. Reinforcing climate anxiety to initiate climate action without a concept to address the health impact the individual might face is ethically questionable. How aware are pre-service teachers of the impact of climate change on their professional mission? Are they equipped to prepare students for life in an unstable future? This research will highlight insights into the perspectives of future teachers.

Understanding map skills and their development using eye-tracking

Péter **Bagoly-Simó**, Nikolaus von Schmettau, Ádám Tóth, Anett Kádár

Maps are deeply embedded in human culture, functioning not only as tools for navigation but also as rich cultural artefacts that convey how societies perceive and engage with their environments. Over time, the role of maps has expanded, prompting interdisciplinary research and their incorporation into formal education to develop map-reading skills. In recent years, eye-tracking (ET) has emerged as a key methodological approach in cartographic research, driven by technological advances that have made ET tools more accessible. This method provides objective insights into cognitive processes such as attention, perception, and cognitive load, particularly when combined with complementary methods like think-aloud protocols, observation, and questionnaires. ET has revealed recurring user behaviours, including a consistent scanning pattern from the top left to the bottom right of map layouts. While several review studies have explored how general map users interact with cartographic materials through ET, a targeted investigation into how students engage with maps in educational contexts remains underdeveloped. This presentation addresses that gap by conducting a mapping review focused on the intersection of formal education, map skills, and ET, analysing literature published since 2017. The review employed a multi-step strategy, beginning with the literature cited in existing ET studies, followed by archival searches of key journals highlighted in meta-studies, and extended through database searches in education and geography. Additional relevant publications were identified through reference mining. Computer-assisted content analysis was applied to classify and interpret themes across a curated sample of 52 papers, which is still undergoing review. This presentation will outline the preliminary findings and propose directions for future research that integrate conceptual and empirical perspectives on the use of ET to understand map literacy development in formal educational settings.

From A to B (and beyond): Tracing shifts in Geography Education's take on mobility

Péter **Bagoly-Simó**, Michael Lehmann

Transport and mobility have long been central themes in geography education, reflecting their crucial role in shaping spatial relations and human-environment interactions. Over the decades, shifts such as increased individualisation, changes in modal split, and a growing emphasis on sustainable development have significantly transformed mobility patterns and the overall discourse on spatial mobility. This paper presents a comprehensive literature review that encompasses both conceptual and empirical studies related to transport and mobility. The review pursues two main objectives: first, to clarify key concepts and theoretical approaches within the field; and second, to map the regional focus, thematic areas, and methodological trends characterising research on transport and mobility. By synthesising existing scholarship, the paper highlights how the discourse has evolved in response to socio-economic and environmental challenges and identifies gaps and opportunities for future research. This review thus contributes to a more nuanced understanding of the dynamic interplay between mobility, transport systems, and geography education.

The roles of fieldwork in modern Geography Education

Firuza **Begham Mustafa**

Fieldwork is a key component of geography education. Fieldwork fills the gap between theoretical knowledge and practical application. It enhances students' understanding of geographical concepts by providing experiential learning opportunities, engaging them with physical and human environments. The study aimed to investigate the functions of fieldwork in modern geography teaching. The methodology used for this research consisted of in-depth interviews, focus group discussions, participant observations, and field surveys. Data is combined from mixed-method approaches and secondary data analysis to get a holistic understanding of fieldwork roles. According to the research findings, fieldwork helps students learn crucial abilities, including observation, data collecting, map reading, spatial analysis, and critical thinking. It also fosters environmental awareness, encourages inquiry-based learning and teamwork, and promotes communication and collaboration. By situating learning in real contexts, fieldwork not only deepens academic knowledge but also cultivates a sense of responsibility and relevance in addressing contemporary geographical challenges. By engaging with real environments and communities, students gain a deeper appreciation of geography's relevance to everyday life and global challenges. This abstract underscores the pedagogical and transformative roles that fieldwork plays in cultivating well-rounded, competent, and environmentally conscious modern geography learners.

Water and our common future – raising awareness of water sustainability in Geography Education

Merle **Biermann**, Christiane Meyer

Water is life! The essential importance of water is linked to selected SDGs of the 2030 Agenda, as well as to Germany's National Water Strategy (2023), especially with regard to the climate crisis. In German geography education, water-related contexts are only addressed in fragments; for example, topics such as the natural water cycle or causes of flood events are explored in more depth, while interrelated topics such as wastewater treatment, water pollution, water scarcity/stress in different regions of the world or nature-based solutions to foster climate resilience are rarely considered or focused on in the same context. This fragmented way of teaching water-related topics prevents the diverse everyday connections from being woven into a bigger picture to develop comprehensive water awareness. Therefore, it is essential to promote water awareness and its importance not only among learners but also among teachers and teacher candidates. The presentation gives an insight into a knowledge transfer project that will be implemented from July 2025 to September 2026 in Lower Saxony, Germany. As part of the project, three panel discussions will be held to present current professional perspectives on topics such as blue-green infrastructures or Germany’s global water consumption to a broader public. One of the discussions will focus exclusively on the importance of and approaches to raising and promoting water awareness in the context of Education for Sustainable Development in school education. Insights gained from these discussions, as well as from additional exchanges and interviews with experts, will be disseminated through a project website and a regional brochure, providing professional foundations and suggestions for experiential learning, thus contributing to greater public awareness of water. Additionally, a training course for teachers will be implemented to help integrate these findings into school education. Against this background, suggestions are made on how geography education can promote water sustainability and awareness.

Redecorating our geography classrooms with Augmented Reality (AR)

Anne **Chawanda**, Megan O'Meara, Amyleigh Tolmay, Lwandile Shelembe, Kiara Joannides, Julia Veale

This presentation explores the integration of Augmented Reality (AR) in geography education, emphasising its potential to enhance student engagement and spatial understanding. As technology advances, AR offers an innovative approach to visualising complex geographical concepts, making learning more interactive and immersive. The primary objective of this study is to assess how AR can be effectively incorporated into geography lessons to improve student comprehension and participation. The presentation will outline key AR tools and applications, demonstrating their ability to bring abstract geographical phenomena to life, especially for topics like astronomy, geomorphology and settlements. A qualitative research approach is adopted, incorporating classroom observations as well as a comparative analysis of AR and traditional teaching methods. Additionally, this research evaluates teacher readiness and the infrastructural requirements necessary for successful AR adoption. The anticipated outcomes of this research include a deeper understanding of AR's impact on student learning, identification of best practices for integrating AR into geography curricula, and recommendations for educators and policymakers on leveraging AR technology effectively. By bridging theoretical knowledge with real-world applications, this presentation aims to contribute to the advancement of digital learning strategies in geography education.

The educator content, pedagogical and technological knowledge competency integration gap in map skills: Evidence from the University of Johannesburg's in-service teacher training program in Gauteng, South Africa.

Thandiwe **Chidzungu**, Thea Schoeman

Effective instruction in geography mapwork depends significantly on the integration of content knowledge (CK), pedagogical knowledge (PK), and technological knowledge (TK). However, teachers face challenges due to the theoretical, methodological, and technical demands of geography. Some educators may not specialise in geography, and others may not have kept pace with the latest technological advancements in geography education. In this context, the study examines mapwork content, pedagogical, and technological knowledge integration in geography instruction among 52 geography educators from Gauteng Education District schools who participated in the mapwork in-service teacher training at the University of Johannesburg, South Africa, in 2021. A mixed-methods approach was adopted for the study, utilising a survey questionnaire for data collection alongside a desktop review. The study revealed good integration of CK, PK, and TK in reading and interpreting maps and orthophotos, and low CPTAK integration in understanding terrestrial and fluvial landforms, map calculations, GIS and remote sensing. The study attributed this low integration to a lack of soft skills, a scarcity of resources, time constraints, a lack of specialisation, and a lack of map skills training among the study attendees. The study participants rated textbook content delivery the lowest (73.5%), while YouTube and PowerPoint presentations received ratings of 84% and 80%, respectively. However, most participants interacted more with the textbook relative to PowerPoint presentations and YouTube videos. The study recommends that specialist geography teachers undergo short learning programs on integrating information and communication (ICT) technology into their established CK and PK. Non-specialist teachers keen on teaching geography should undergo in-service training to improve their CK and PK; hence, their integration of TK if they readily have the necessary ICT training. Furthermore, the study advocates that educators should get laptops and essential software like ArcGIS as part of their teaching resource packs from the state or the responsible authorities.

Learning Geography: interdisciplinary educational practices of creativity and metacognition

Iara Rosa **da Silva Bustos**, Vinícius da Matta, Izilda Makibara, Thaís Martin, Michael Santos e Gisa Gasparotto

The contemporary world as a whole is in permanent transformation, and this places us faced with a need to put into practice interdisciplinary educational activities that develop the best of students' human cognitive potential. A common dilemma that occurs with teachers who have been in the classroom for a long time is to challenge themselves, update themselves and, above all, work together with other areas, especially arts and language. Bruner and Nietsche bring an analogy from Greek mythology about the dichotomy between Apollo and Dionysus that we can think of in education. In the learning process, Apolo's training would be perfect, forming a good, well-informed and cultured citizen. The formation of Dionysus is associated with the enthusiasm, metamorphosis, and freedom typical of the arts. Practices in basic school education in regular schools in Brazil suffer from this dichotomy of training Apollos or training Dionysus. Admission tests for university entrance exams tend to guide how Geography teaching should occur, but at the same time, it is necessary to develop in students a conscious education about life and its changes in the Anthropocene era. One possible path for this research and practice work is to develop language with metacognition and creativity using techniques, processes and repertoire on geographic themes: (1) Conscious consumption - SDG 12: Responsible consumption and production (2) Anthropocene and climate change – SDG13: Climate action (3) Discovering territories (4) Geography in the palm of your hand. The themes were applied with 240 students aged 11 to 12 between the academic years 2024 and 2025 in a private school called Centro Educacional Pioneiro, São Paulo. Based on the themes, four creative activities were proposed for students who had the freedom to explore different possibilities of creation in the arts and letters. The themes resulted in final products that used art under techniques and processes, along with the development of language that represented the thinking that involved the construction of a repertoire of metacognition on geographic themes.

Exploring a sense of place through a blended learning approach: Lessons and insights

Nerhene **Davis**, Serena Coetzee, Christiaan Struwig, Hlamarisa Ndhlovu

Blended learning, which integrates online and face-to-face instruction, provides a dynamic approach to explore complex concepts such as sense of place, the emotional and cognitive connections individuals form with their environment. As part of a larger collaborative funding project, this study examined how a blended learning approach can be used to enhance undergraduate geography students' understanding of the sense of place. To meet this stated intent, we combined experiential digital mapping exercises, pre-recorded lectures and reflective essays as assessment tools for a third-year Human Geography module. We then used a mixed-methods research approach, which included heat mapping of the digital exercises, the thematic analysis of questionnaires; and student feedback, to evaluate the usefulness of blended learning in fostering a deeper understanding of the core concepts and the application of this understanding in the design of a research project for students enrolled in the same module over three years (2023-2025). Findings suggest that incorporating digital mapping experiences and reflective essays as assessments enhanced the students' ability to articulate their ideas about sense of place more coherently, and their critical awareness about researcher positionality is more evident in their reflective accounts. By bridging physical and virtual learning spaces, this research highlights the potential of blended learning to cultivate meaningful connections between students' understanding of sense of place and their approaches to the design of a research project.

Coordinates of Success? Evaluating the school-to-university Geography trajectory

Francois **de Bruyn**, James Gregory, Clinton van der Merwe

This study examines the influence of high school geography education on the academic preparedness and career pathways of undergraduate students at a public university in Gauteng, South Africa. Geography, evolving from rote memorisation to an interdisciplinary field, integrates spatial reasoning, data analysis, and Geographic Information Systems (GIS) to address global challenges such as climate change and urbanisation. Despite its relevance, limited research examines its role in preparing students for university-level geography, particularly in South Africa, where declining enrolment, resource disparities, and a lack of experiential learning opportunities hinder progress. This study addresses that gap by assessing how high school curricula foster essential skills and by identifying systemic barriers to success in higher education. A mixed-methods approach was employed, surveying 100 undergraduate geography students selected through purposive, convenience, and stratified sampling to ensure representativeness across diverse backgrounds. Quantitative data, analysed using SPSS, measured perceived preparedness, while qualitative responses, processed through Braun and Clarke's thematic analysis, explored student experiences. Ethical protocols, including informed consent and confidentiality, were strictly observed, with data collection designed to capture both statistical trends and nuanced perspectives. The analysis revealed 15 themes, including positive attitudes towards geography, curriculum relevance, digital skill deficiencies, and challenges within resource-constrained environments. Findings indicate that while high school geography cultivates critical competencies, its efficacy is curtailed by misaligned curricula, limited fieldwork, and unequal access to digital tools such as GIS. The study recommends improved resources, experiential pedagogies (e.g., fieldwork and GIS training), and stronger alignment between secondary and tertiary education to enhance student outcomes. These evidence-based recommendations aim to inform educators and policymakers, strengthening South Africa's geography education framework in support of academic and professional success.

Integrating geographical competences in STEAM education and training for urban sustainability

Rafael **de Miguel González**

This paper explores the critical role of geographical competences in enhancing STEAM (Science, Technology, Engineering, Arts, and Mathematics) education and promoting urban sustainability, based on evidence and practices developed through the European Union-funded projects STEAME.eu and UBITEACH.eu. Geography, as a bridge discipline between the natural and social sciences, offers key analytical, spatial, and systemic thinking skills that are essential for understanding the complex challenges faced by contemporary cities, particularly in the context of climate change, biodiversity loss, and social equity. Both projects emphasise innovative pedagogical strategies and cross-disciplinary learning environments that reflect real-world challenges. STEAME.eu promotes integrated learning frameworks that foster creativity, problem-solving, and civic engagement through interdisciplinary collaboration. Meanwhile, UBITEACH.eu focuses on enhancing education and training for urban biodiversity and sustainability through digital tools and competence-based teaching. Geographical competences—such as spatial literacy, critical cartography, geospatial analysis, and place-based inquiry—are positioned at the core of these frameworks, allowing students to interpret, model, and act upon complex spatial phenomena. Through digital mapping, collaborative fieldwork, and inquiry-based learning, learners develop a deeper understanding of their urban environment and acquire tools to co-design sustainable futures. The paper highlights case studies, methodological innovations, and competence models developed within both projects, showing how geography supports the integration of sustainability goals and 21st-century skills in education. It argues that embedding geographical thinking into STEAM curricula is vital for preparing learners to engage critically and creatively with global and local challenges, ultimately supporting the transition to more sustainable, inclusive, and resilient cities.

Transforming Geography Education through Textbook Innovation: The Shanghai Model

Yushan **Duan**, Hermione Xin Miao

As geography education evolves to address global challenges, curriculum innovation and learning system development become critical for preparing students with the competencies needed for the future. The Shanghai Education Edition junior secondary school geography textbooks embody a transformative approach to geography learning by integrating an interdisciplinary themed learning system with an innovative studying guidance system. This learning system is designed to support students in developing geographical inquiry skills, spatial thinking, and real-world problem-solving abilities through structured yet flexible pedagogical scaffolding. A key feature of this learning system is its interdisciplinary integration, which connects geography with science, technology, environmental studies, and social sciences. This approach enables students to explore contemporary global issues—such as climate change, urbanisation, and sustainability—through a geographic lens, fostering a holistic, interconnected, and future-oriented understanding of the world. More importantly, the textbooks also incorporate digital learning resources, geospatial technologies, and inquiry-based activities, equipping students with 21st-century skills that align with the International Charter on Geographical Education (IGU-CGE, 2016). The Shanghai model provides a systematic framework that balances national curriculum requirements, local educational characteristics, and international geography education standards. By fostering learners' agency, critical thinking, and global citizenship awareness, this model ensures that students are not only recipients of knowledge but also active participants in mapping their learning pathways. Through a comparative analysis of geography textbook innovations in different regions, this study highlights how pedagogically guided learning systems can serve as a catalyst for educational transformation, offering insights into how geography textbooks today can shape the geographical learning of tomorrow.

Re-imagining the past: Using AI-powered visualisation in the Geography classroom

Mary **Evans**, Ruby-Anne Birin, Jasper Knight

Geography is a highly visual subject, and as field-based learning becomes increasingly complex and expensive, teachers can turn to AI to recreate images of inaccessible environments and people from the past. AI-powered visualisation can create realistic descriptions and visual representations of the physical environments, urban landscapes, and people living during different historic and prehistoric periods. Artistic renditions of past people often reveal binary perspectives, such as Edenic scenes or portrayals of barbaric savages, based on the artist's interpretation. The development of artificial intelligence (AI) generative platforms enables the recreation of visualisations of various scenes. The iterative process of prompt changes undertaken when teachers interact with AI systems allows for the generation of multiple images. In this study, we used Midjourney v6.0 and DALL-E 3 to generate images of environmental scenes and people using various prompts. Both AI tools generated similar images but tended to render people from the Palaeolithic period as middle-aged, white males. When prompted to generate images of women, the tools included more diversity in their image generation. However, generating images of people from past lives comes with moral and ethical constraints which need to be addressed within the social and cultural context of the archaeological period. This also has implications for how learners perceive and make sense of the past. Therefore, we note that AI-generated images should be trained and developed by knowledgeable creators rather than by individuals who have little understanding of the environment and people they are trying to reproduce.

… and what about climate justice? Climate Justice Education in Space and Time: The cases of Norway and South Africa

Erlend **Eidsvik**

This paper aims to explore how education in Norway and South Africa frames climate justice in curricula and textbooks in geography and social sciences. Climate justice (and environmental justice) has gained impetus and importance in decision-making and action on climate change. Given the recent surge in politicisation, censorship, and sanctioning of research on climate justice in the US, the topic is now more relevant—and more contested—than ever. Arguably, climate justice is a human rights issue where equity is at the core in analysing dimensions of inequalities: structural, socioeconomic and intergenerational. It is, therefore, a crucial component of the just transition toward a (more) sustainable future, encompassing both temporal and spatial dimensions. This would require a population that is informed and educated about climate justice. The question is then: To what extent are aspects of climate justice, across time and space, emphasised and framed in curricula, textbooks, and classroom teaching? The paper investigates how aspects of climate justice are represented in curricula and geography and social science textbooks at the secondary school level in Norway and South Africa. The analysis will apply a comparative setup to analyse the educational policyscapes of both countries through the lens of climate justice.

Challenges in Sustainability Education: Powerful knowledge and powerful geography to the rescue?

Erlend **Eidsvik**

This presentation explores the concept of sustainability and sustainable development in education, particularly in light of crisis perspectives, knowledge, transformation, and curriculum design. We start by critically addressing the overuse and dilution of the terms "crisis" and "sustainability," which often strip them of their original meaning and impact. Drawing on the Norwegian LK20 curriculum, where sustainable development is a key interdisciplinary element, this paper evaluates its effectiveness as a response to global crises like climate change, inequality, and environmental degradation. In the curriculum, sustainable development is presented as a globally anchored concept, intended to address environmental, economic, and societal challenges through education. The goal is for students to understand these dimensions holistically and act towards a sustainable future. However, the authors question whether current sustainability education fulfils this promise. Criticism of sustainability education includes its lack of contextual teaching, an overemphasis on individual responsibility rooted in neoliberal thinking that suppresses diversity of perspectives and critical citizenship. Moreover, sustainable development teaching primarily addresses environmental aspects at the expense of socioeconomic issues, leading to an imbalanced understanding. To address these shortcomings, the authors propose integrating "powerful knowledge" and "powerful geography" frameworks. These concepts aim to enhance students' contextual understanding, enabling them to critically analyse connections from local to global scales. By focusing on geography and economics, this paper suggests a renewed, knowledge-driven approach to sustainability education that better equips students to address crises and make informed decisions.

Value of place-based fieldwork in the local environment

Pamela **Esterhuysen,** Clinton van der Merwe

This paper addresses the importance of place-based fieldwork by integrating the affective, kinaesthetic, social and cognitive domains that contribute to a holistic learning process. This includes the development of metacognitive skills in learners undertaking geographical enquiry outside of the classroom. The use of the local environment or the surrounding areas to the school grounds levels the playing field for all schools conducting field studies. Enquiry or problem-based, experiential learning (in the environment) will allow learners to gain a sense of place, which may impact their attitudes and behaviour towards the place in which the studies are conducted. Case studies conducted on local microclimate in the school grounds; evaluating a local stream flowing through the school grounds or in the neighbourhood in terms of water quality and the current ecological status of the stream, as well as a walkability study through the local urban area have been used to assess how the different domains of learning may be integrated to reinforce the concept that the development of metacognitive skills which will promote a deeper understanding of the environment and the issues that need to be addressed. The outcomes will enable critical thinking to take place. The collaboration with Citizen Science Agencies in local field studies increases the importance of place-based enquiry and highlights the value of working together as part of a larger network of scientists, academic institutions and environmental groups, to monitor and address environmental and social issues. The overarching outcome is that this type of field enquiry can be conducted regularly with a variety of classes that will contribute to the progressive development of geographical skills. Secondary data also becomes available for further research in the higher grades, and enquiry-based learning is reinforced.

Smartphone-integrated geo-media for transformative climate education in Nigeria, Uganda and South Africa: A pilot study

Emmanuel **Eze**, Rainer Mehren

Geography education plays a vital role in shaping how young people understand and respond to the environmental challenges of our time. Across Sub-Saharan Africa (SSA), where climate change intersects with deep-rooted educational inequalities, there is a growing urgency to reimagine sustainability education through innovative, accessible, and locally grounded pedagogies. However, traditional classroom approaches and outdated curricula have failed to adequately prepare teachers and students for climate adaptation and action, especially in contexts where digital infrastructure is limited and youth voices are underutilised in shaping educational change. Here, our study shows how smartphone-integrated geomedia, co-developed with educators and learners, can serve as a transformative tool for equipping African youth with the spatial awareness, critical thinking, and digital fluency needed for environmental stewardship and community resilience. Drawing from a qualitative research framework, this ongoing study engages teachers, students, and education stakeholders in South Africa, Uganda, and Nigeria to unveil peculiar needs and possibilities for sustainability education using mobile technology. Preliminary findings from the literature synthesis already indicate widespread interest but significant gaps in training, curriculum alignment, and access to resources. Our ongoing interviews will provide deeper insights. By facilitating experiential learning and youth-led climate storytelling, this study seeks to empower learners as change agents capable of driving adaptation at the grassroots level. Furthermore, the study contributes to the broader dialogue on globally relevant yet locally responsive geographical learning. It offers practical strategies for integrating low-cost digital technologies in resource-constrained settings and opens new pathways for climate-conscious curriculum innovation, teacher capacity-building, and youth engagement across the continent.

A content analysis of virtual field trips in a Geography higher education classroom

Alan **Felix**

Although various literature has been published on virtual field trips (VFTs), little reflection of studies in the South African primary school geography Higher Education classrooms is reflected in the current literature. In response to the increased demand to incorporate technology in higher education teaching and learning for quality teacher-student success, this study (in progress) wants to examine the application of primary school pre-service teachers' VFT assessments and their perceptions in the development of their activities (activities already submitted and assessed). This qualitative study will utilise the lens from Mishra and Koehler's technological pedagogical and content knowledge (TPACK) as a theoretical framework to provide a holistic view of the study. This framework is deemed to be useful to improve teacher training, to prepare future teachers, to identify gaps in knowledge, and to encourage teacher-students to reflect on their practices. The class size of fourth-year pre-service teachers in the geography class consists of 76 students, which will be analysed and triangulated using content analysis of the VFT activity submissions and the pre-service teacher questionnaires (this number will differ based on the approval of consent of the students). The content analysis will be systematically reviewed and coded based on criteria such as linking content with curriculum, dissemination modes, recreating the real world and navigating within a VFT. Preliminary findings suggest that VFTs offer rich interactive alignment; there is variability in alignment with curriculum and differentiation in the lack of depth. Furthermore, the study will identify key characteristics of effective, high-quality designs of VFTs.

Insights from the South African Council of Educators (SACE) endorsement of a GIS course for educators and the need for a SACE-endorsed early learning spatial literacy professional development workshop.

Bridget **Fleming**, André Jacobs

This study explores the rationale behind the South African Council of Educators' (SACE) endorsement of a Fundamentals of GIS for Educators course, offered in English, Afrikaans, and isiZulu. The course was designed for a hybrid delivery method and aligned with the national curriculum to enhance accessibility and relevance. The endorsement process and its implications for professional development will be discussed. Conducted over a year across four provinces with a sample of 92 teachers, the study highlights the national demand for geospatial literacy in education. Feedback from participants underscored the need to prioritise foundational map skills development before introducing GIS concepts. This is further supported by an analysis of final-year Grade 12 mapwork performance in both the National Senior Certificate (NSC) Department of Basic Education (DBE) and the Independent Examination Board (IEB) examinations. An important incentive for participation was the allocation of Continuing Professional Development (CPD) points, which encouraged educator engagement. Furthermore, SACE recognised the necessity of early intervention in spatial literacy and recommended the development of Foundation Phase and Early Learning Professional Development workshops. These workshops will introduce basic map awareness using GIS tools to produce localised and simplified maps. This study highlights the importance of progressive geospatial education, starting from early learning stages, to strengthen map literacy and spatial thinking skills across the education system.

A scoping review of Geography Education research in South Africa, 2014-2024.

Paul **Goldschagg**, Di Wilmot

We live in an intricately interconnected world characterised by rapid change, complex global social and environmental challenges. There is a broad consensus amongst geography education researchers that geography education (GE) at all levels (primary, secondary, higher education) has a pivotal role to play in addressing global challenges. GE research attends to problems of the day in different national and local contexts. Research conducted by Wilmot and Van der Merwe (2025) provides partial insights for understanding how GE scholarship in South Africa is contributing to the field of enquiry. In response to the call for more extensive analytical work, we conducted a scoping review that documents and provides an overview of GE research in South Africa from 2014 to 2024. This is important for identifying topics attracting the most research interest, the location of the study, the scope and level, the research method used, and for understanding how South African GE research is navigating the global/local interface. The scoping review process used Arksey and O'Malley's six-step framework (2005) as applied by Mc Kenna and Van Schalkwyk (2022). Key words were used to search four databases for peer-reviewed journal articles published between 2014 and 2024, and the research repositories of South African higher education institutions for GE master's dissertations and doctoral theses. Curriculum, pedagogy and assessment were used as a thematic analytical framework. The findings reveal a preponderance of small-scale contextualised empirical studies focused on problems of the day. The paper concludes with some propositions for a future research agenda that may move GE scholarship in South Africa forward. This may be useful to policymakers and teachers wishing to embark on postgraduate research projects, as well as emergent and established researchers in GE.

Beyond the classroom: Geography teachers' motivation for and challenges in participation in self-directed professional development

Aubrey **Golightly**

This study explores geography teachers' motivation for and challenges in participation in self-directed professional development (SDPD) activities to improve their geography knowledge and skills, as well as teaching and learning practices. A non-experimental survey design was employed in the study. Further education and training geography teachers (n = 130) from the Dr Kenneth Kaunda and Bojanala Platinum districts in the North West province in South Africa completed the Self-directed Professional Development in Geography Education (SDPDGE) questionnaire developed by the researcher. One section in the SDPDGE questionnaire focused on the motivation of geography teachers to participate in SDPD and the challenges that hinder their participation in SDPD. The category dealing with the challenges that geography teachers experience was divided into three subcategories, namely a) geography teachers' knowledge and skills; b) high workload and no incentives; and c) qualifications, motivation and extramural activities. The practical significance differences (effect size) in the geography teachers' gender, years of teaching, school quintiles, qualifications, and motivation to participate in SDPD activities, along with the challenges that hinder their participation, were reported. The results indicated that most geography teachers were involved in SDPD activities to improve their geography knowledge, facilitate active learning in their classrooms, and create effective learning environments in the geography classroom. Small, practically significant differences between male and female geography teachers' motivation to participate in SDPD activities were reported. Most of the geography teachers highlighted a high teaching workload, involvement in administrative tasks and no financial incentives for geography teachers to be involved in SDPD activities as possible reasons for geography teachers' non-participation in SDPD activities. Medium, practically significant differences between male and female geography teachers, as well as between geography teachers in low and high quintile schools, and the "qualification, motivation and extramural activities" subcategory were reported.

MapStrApp: A Digital Tool for Developing Map Use Strategies in Secondary Schools

Martin **Hanus**, Lenka Krajňáková, Martin Kutiš, Dana Řezníčková, David Trokšiar, Veronika Bernhäuserová

Educational research often discusses strategies as structured plans for problem-solving, typically presented as lists of techniques or tips. However, these are frequently not grounded in empirical evidence or theoretical frameworks. Addressing the gap between theory and classroom practice, the MapStrApp project has developed an innovative, research-informed online application designed to foster students' cognitive strategies for map use in a structured and systematic way. Rooted in the principles of scaffolding and adaptive computer-assisted learning, MapStrApp supports the development of a wide repertoire of cognitive strategies and promotes adaptive strategy use among secondary school students. This presentation introduces the pilot version of the application, outlines its core pedagogical and technical features, and discusses its innovative potential in both educational and technological contexts. In addition, preliminary research findings from a pilot implementation are shared, focusing on the impact of the app on students' strategy use—specifically their repertoire of used strategies and their ability to adapt strategies to different task types. These insights contribute to the ongoing conversation about how digital tools can meaningfully support geography education and cognitive skill development in the classroom.

A cross-age comparison of pupils' conceptual understanding of contour lines: Preliminary results

Martin **Hanus**, Lenka Krajňáková, Tomáš Bendl, Miroslav Marada, Oldřich Mokruša, Simona Pekárková

Contour lines are a common cartographic representation used to depict elevation and terrain features in maps, yet pupils often struggle to read and interpret them correctly. Comprehending how a conceptual understanding of contour lines develops across different educational levels may provide valuable insights for geography education. This presentation reports on the preliminary results based on a pilot study examining pupils' understanding of contour lines at three educational levels: primary, lower- and upper-secondary. The study employed a four-tier conceptual test designed to assess not only pupils' conceptual understanding of contour lines but their certainty in answers and reasoning as well. Data were collected from a pilot sample of pupils across the three age groups, specifically from Grade 4 (9 to 10 years old), Grade 8 (13 to 14 years old), and Grade 12 (17 to 18 years old). Participants' responses were analysed to identify pupils' distribution based on their conceptual understanding and response certainty and to determine common alternative conceptions. Particular attention was given to the differences in conceptual understanding between younger and older pupils and the persistence of alternative conceptions despite increased educational experience. The presentation will also discuss the implications of these findings for geography teaching practices. Finally, the study's limitations and planned refinements for the following research phase will be outlined.

Decolonising Climate Change Education: Perspectives from Kalimantan

Carla **Hermanussen**

In the face of the escalating impacts, shifting terms from "climate change" to "climate crisis" is crucial to reflect the urgency of the situation. The legacy of colonial times continues to shape global hegemonies of the so-called Global North, which are reinforced by the climate crisis in multiple ways. First, many countries in the so-called Global South - often former colonies - have contributed the least to the climate crisis but are disproportionately affected. Second, in research and climate change education in the Global North, knowledge production and approaches from the Global North dominate, while, as already long criticised in post-colonial theories, insights from the Global South often remain marginalised. Indigenous knowledges, especially, remain underrepresented, even though they often provide sensible solutions. The lack of focus on educational approaches from the Global South is particularly criticised, as these offer the opportunity to provide practical and cross-societal approaches. Therefore, greater emphasis on integrating these perspectives in (Global North) research and education is necessary for a global, sustainable and just response. To address this gap, an ethnographic study was conducted with (indigenous) formal and informal educational practitioners in Kalimantan, Indonesia, through interviews and participant observations. It focused on aspects of local understandings of the climate crisis, perceived key methods and perspectives on responsibility and global justice. The data analysis was conducted with qualitative content analysis by two researchers. The findings highlight the significance of local contextualization across all three aspects and the significance of responsibility at the national and individual levels. Additionally, despite some scientifically superficial understandings of the climate crisis, many approaches that are widely discussed as effective in academic literature are already being practised. This article presents key research insights and aims to foster future collaborations while encouraging critical discussions on the possibilities of decolonising climate crisis education.

Expressive Evaluation for Promoting Deep Learning — Taking the Wenyu River Project Research as an Example

Dong **Haowei**, Zhao Chao

Performance evaluation has been entrusted with the important mission of solving the negative effects of traditional pen-and-paper tests since it was proposed. The expressive evaluation design model centres on construction, promotes deep learning, and is conducive to the cultivation of geographical core literacy. Based on the natural geographical resources of the Wenyu River, guided by the requirements for cultivating geographical practice ability, and aiming at cultivating students with a sound personality in the new era, the feasibility of project-based research is designed, and the realisation path of performance evaluation is discussed.

Geographies of Misinformation: Pedagogies for navigating fake news, media literacy, and critical thinking in geographical education

Gillian **Kidman**, Hazel Tan

In an era increasingly defined by digital saturation and algorithmically curated content, misinformation and fake news present critical challenges to civic society and educational practice. Geography, as a subject grounded in spatial thinking, place-based inquiry, and critical analysis of human-environment interactions, is uniquely positioned to equip students with the tools to navigate these challenges. This paper examines how misinformation, particularly regarding climate change, migration, pandemics, and geopolitical conflict, circulates within media ecosystems and shapes public perceptions of global issues. Drawing on case studies from Australia, the research explores contested media narratives and how, as educators, we need to facilitate critical interrogation of source reliability, bias, and spatial context. We suggest that explicit instruction in media literacy and numeracy framed through geographical concepts such as scale, perspective, interconnection, and representation can deepen critical engagement and empower them as informed global citizens. This presentation argues for reconceptualising geographical education to include the analysis of digital landscapes as spaces where truth is negotiated, rather than merely delivered. By situating fake news within geographic inquiry, the presentation offers a pedagogical framework for teaching critical media literacy and numeracy that bridges disciplinary knowledge, ethical reasoning, and digital awareness. We call for curriculum innovation that strengthens capacities to detect, decode, and challenge misinformation, skills that are foundational to democratic participation and resilience in a rapidly changing world.

Developing a four-tier test for diagnosing conceptual understanding in pupils of different age groups

Lenka **Krajňáková**, Martin Hanus, Tomáš Bendl, Miroslav Marada, Oldřich Mokruša, Simona Pekárková

Understanding pupils' conceptual understanding and, particularly, identifying their alternative conceptions is crucial for effective teaching and learning. Traditional assessments often fail to capture the depth of pupils' conceptual understanding and the reasoning behind their answers. The paper introduces the process of the development and validation of a four-tier conceptual test designed to diagnose pupils' conceptual understanding among three educational levels (elementary, lower- and upper-secondary). The presented test focuses explicitly on pupils' understanding of contour lines on maps, given that this concept is critical, for instance, for the identification of natural hazards or decision-making in urban planning. Moreover, previous studies showed that understanding, reading, and interpreting contour lines on maps are challenging even for university students in geography-related fields. The presentation will discuss, in general, the process of four-tier test design, including the selection of assessed propositional knowledge, test item development, the integration of pupils' certainty measures, and the transformation of open-ended items to multiple-choice. Attention will be given to the validation process, exploring how expert and teacher reviews, pilot testing, and item analysis can ensure the test's reliability and effectiveness in assessing pupils' conceptual understanding and identifying their alternative conceptions. The contribution will also discuss the four-tier tests' advantages over conventional diagnostic tools, as well as their potential limitations and our research approach to reducing them. By presenting this approach, the study aims to foster a dialogue on improving the assessment of pupils' conceptual understanding in geography education and beyond.

Design for Interdisciplinary Thematic Learning in Geography to Cultivate Scientific Spirit: Values, Principles, and Pathways

Haonan, **Liu**, Han Jiaqiang, Zhou Xinghua

This study aims to design an interdisciplinary thematic learning framework in geography, guided by the goal of cultivating a scientific spirit, through a theoretical analysis approach. As a comprehensive learning method, interdisciplinary thematic learning in geography plays a vital role in fostering students' scientific spirit, including rational thinking, critical questioning, and a spirit of inquiry. The design of interdisciplinary thematic learning in geography, guided by the goal of cultivating a scientific spirit, is a systematic endeavour that requires adherence to design principles based on scientific rigour, disciplinary relevance, interdisciplinarity, and inquiry. The design approach follows key ideas such as "grounding in theoretical foundations and clarifying design intentions," "focusing on scientific spirit and defining learning themes," "setting learning objectives based on students' learning conditions," and "integrating real-world contexts to deepen inquiry." The design process follows a systematic sequence: "refining inquiry themes, defining learning objectives, creating practical tasks, designing implementation strategies, and developing evaluation plans."

Organisational sensemaking in the implementation of Geography achievement standards

Mengyuan **Lu**

This study explores how high school geography teachers in rural southern China navigate the implementation of Achievement Standards (AS). Specifically, it examines how teachers reconcile exam-driven expectations with broader educational objectives, such as fostering critical thinking, civic responsibility, and preparedness for future challenges. Guided by an organisational sensemaking framework, this research investigates how geography educators interpret and apply AS—a core component of contemporary curriculum frameworks. It identifies key challenges, including institutional constraints, exam pressures, and the tension between standardised assessments and innovative teaching approaches. While external mandates shape instructional practices, the study highlights how teachers exercise agency to adapt pedagogical strategies and develop creative solutions within these structural limitations. The study employs semi-structured interviews with 11 participants (six geography teachers and five school leaders), offering in-depth insights into their strategies for integrating transformative geographical education while complying with AS mandates. The participants' diverse roles provide valuable perspectives on pedagogical practices, available resources, and institutional support structures. Additionally, the study explores how teachers leverage professional networks, engage in collaborative learning, and adopt adaptive strategies to navigate curricular constraints and enhance student engagement. The research underscores the imperative to transcend short-term assessment outcomes in favour of a more holistic educational paradigm. Geography education is uniquely positioned to cultivate critical thinking, spatial awareness, and global interconnectedness—competencies essential for addressing complex 21st-century challenges. Anticipated outcomes include actionable strategies for curriculum innovation, enhanced teacher agency, and insights into how educators negotiate competing policy demands. By emphasising locally responsive yet globally relevant approaches, the study advocates for a shift from assessment-driven learning toward holistic geographical education. Such an approach equips students with adaptive skills, interdisciplinary knowledge, and the capacity for lifelong learning, enabling them to thrive in a rapidly evolving world.

Developing a Secondary School Cryosphere Science Literacy Curriculum: A Place-Based Education and Psychological Distance Approach

Chunlan **Luo Xiao**, Li, Yi Wang

The IPCC AR6 Longer Report highlights that anthropogenic climate change is already exacerbating extreme weather and climate events globally. This could result in cryosphere changes and sea-level rise, and consequently hinder efforts to achieve the Sustainable Development Goals (the SDGs). Due to its remoteness, the cryosphere remains largely unfamiliar to most of the world's population. Addressing this gap, it is imperative to integrate cryosphere science into middle school education to foster literacy in the SDGs among younger generations. Previous relevant curricula often overlooked students' actual cognitive levels, leading to a situation where students still felt that the cryosphere was distant from their lives even after completing their studies. In response to the growing need for geographically relevant and transformative pedagogies, this study explores how place-based education and psychological distance theory can be leveraged to enhance students' engagement with cryosphere science. By integrating these approaches, the study aims to not only enhance students' cognitive understanding but also cultivate transformative learning experiences that reshape their perceptions of the cryosphere and its relevance to their daily lives. To empirically assess these effects, this study employs semi-structured interviews and questionnaires targeting middle school students, geography educators, and scholars in geography and pedagogy to assess their understanding of the cryosphere and their perceived psychological distance from it. Drawing on place-based education and psychological distance theory, the proposed curriculum is structured around three core themes: climate change, cryosphere change, and the SDGs. The curriculum will be organised based on four guiding principles: system thinking, interdependence, comparative analysis, and dialectical reasoning, incorporating AI technology and multimodal interaction in the curriculum implementation process. This study ultimately aims to propose a comprehensive framework for the development of a cryosphere science literacy curriculum tailored to diverse educational contexts. The findings will provide valuable insights for curriculum designers and educators, supporting the targeted integration and sustainable development of cryosphere science education across different regions and school systems.

The impact of code switching on learners' participation and academic performance in a Grade 12 Geography class

Ditiro **Lurelele**, Jabulani Sibanda, Tiani Wepener, Alan Felix

In South African schools, code switching is prevalent due to the country's complex linguistic landscape of 12 official languages recognised in the constitution. Navigating code switching in South African schools requires careful consideration of linguistic diversity and inclusivity, as well as learners' linguistic rights and a supportive learning environment for all learners. This reflective action study sought to investigate the impact code switching has on learners' participation and academic performance in 2 Geography classes at a rural school. The rationale for focusing on Geography is based on the fact that it is a complex subject that often requires the interpretation of spatial data, maps, and complex geographical terms in Geographic Information Systems and poses difficulties to learners who are not familiar with the LoLT. A total of 72 Grade 12 learners participated as two distinct groups in the experimental design study. The study was conducted within an English-Setswana context, with English serving as the Language of Learning and Teaching (LoLT) and Setswana as the Home Language (HL). The study employed the mixed-methods approach (quantitative and qualitative) and adopted the pragmatic paradigm. The qualitative component emerged from classroom observations of learner participation, and the quantitative component emanated from the tests administered to students. Two classes were used, one as an experimental group and the other as the control group for one Grade 12 Geography sub-topic. The control group became the experimental group and vice versa for the other Grade 12 Geography sub-topic. Learner participation and performance were compared in the control and experimental groups for the same class for the two sub-topics to ascertain whether code switching had an impact on the two variables. The observation covered the entire 40-minute lesson duration, and data were captured using the observation schedule in Appendix A. The tests administered were uniform for both the control and experimental groups. The study found that code switching enhanced learners' participation, but that allowing code switching in lessons only, without allowing it in assessments, did not improve learners' academic performance. Therefore, the study recommends an integrated code-switching assessment through partial code-switching and dual-language assessment.

Teaching and learning methods in Geography: The voices of experts towards innovative teaching and learning

Thoko **Mahlangu**

The importance of Geography as a school subject within the curriculum cannot be overemphasised. The teaching of geography requires the knowledge, skills, and competencies that contribute to good academic performance in learners or students. An important argument is that the success of the teachers would lead to the success of the school, the success of the school would also lead to the success of educational institutions, which would also lead to the success of the education system. Studies conducted suggest that the curriculum should be open enough to afford teachers the opportunities to think, innovate and reflect. Curriculum refers to a blueprint for instructional guides which is used in teaching and learning to achieve desirable change in learners. The study employs the conceptual framework of 'empowerment and motivation', which is based on the critical theory as it formulates its basis. Critical theory is used to form the foundation of the conceptual framework to be employed because it is viewed as a theory that holds up the lights of legitimacy and equality issues of voice, ideology, power, repression, representation, interests, inclusion and participation. Critical theory is relevant for this study as its intention is transformative, in changing individuals and society to social democracy. The qualitative research approach will be used because it has increasingly been regarded as a credible and powerful tool for revealing and understanding the human world. Purposive and convenience sampling will be used; hence, a case study of three geography curriculum experts will be conducted. In-depth interviews will be conducted to collect data. A qualitative thematic data analysis approach will be employed. The findings of this study would assist in laying out a foundation for innovative teaching and learning. This study is significant because it would empower teachers and lecturers on innovative teaching methods. Keywords: innovative teaching and learning, geography, teaching and learning methods, curriculum, critical theory, empowerment, motivation.

Local solutions to local problems: Engaging global partners for local climate action and student activism

Sadhana **Manik**, Vibeke Vågenes, Omary Chazua, Nils Ekelund

SDG 13 on Climate Action is a clarion call to all. Bio-geography (Geography and Life Science) Education in higher education institutions globally can endeavour to contribute to Climate Action. Couched within the theoretical underpinnings of theories of change (Reinholz & Andrews, 2020), civic environmentalism and climate action, this paper argues for the need to respond to local challenges by engaging Bio-geography students in participatory action and other forms of research in four country contexts. Hence, this paper explores how Education lecturers (Geography and Life Sciences) utilise the curriculum to prioritise, research and teach about local challenges in their immediate community and initiate change through tangible student involvement in plastic pollution. A qualitative multi-case study approach of Geography and Life Sciences Education lecturers in four countries (Norway, Tanzania, Sweden and South Africa) provides the data. The research style is autoethnography. The findings reveal our common identified focus, which was situated in a 'wicked problem' plaguing communities. The main focus was on plastic pollution in several contexts. We were uncomfortable with the 'underpreparedness' of higher education Geography students to recognise climate and associated ecosystem services challenges related to plastic pollution. However, the findings revealed that students displayed an enthusiasm to learn and to contribute to climate action through their multiple research actions.

The potential of more-than-human geographies for transformative geographical learning

Johanna **Mäsgen**, Veronika Selbach

This paper explores the potential of new approaches to thinking and working geographically for empowering transformative geographical learning. It presents an ongoing intervention study in which students are exposed to new approaches to geography that can be summarised under the term ‘more-than-human geographies’. The project assumes that this will challenge (disrupt) their perceptions of the basic structures of reality (ontology), the possibilities of human cognition (epistemology) and the justification of methodological approaches (methodology). It is hypothesised that learners may find these new perspectives empowering in the sense of a Powerful Geography and that experimenting with unconventional theories and practices fosters transformative learning. The project relates to current discourses in geography education by addressing three key research gaps in the field of ‘geographical thinking’: first, the relationship between conceptual and procedural dimensions; second, the role of procedural geographical knowledge; and third, the role of metacognitive knowledge.

Geographical giftedness: A systematic review

Jakub **Matula**, Michaela Spurná

This study investigates the concept of geographical giftedness, a relatively unexplored area within geography education. As geography gains prominence in educational curricula due to its interdisciplinary nature and relevance to addressing global challenges, identifying and supporting geographically gifted students becomes crucial. The research aims to define geographical giftedness, analyse its characteristics, and explore effective strategies for its identification and development. Methodologically, the study employs a systematic review approach based on PRISMA guidelines. Relevant publications were sourced from Scopus and Web of Science databases using targeted keywords such as "geographical giftedness" and "spatial intelligence." Out of 140 initial records, seven were selected for detailed content and causal analysis. These analyses revealed key traits of geographically gifted students, including spatial intelligence, logical-mathematical reasoning, and the ability to apply geographical knowledge across diverse contexts. The anticipated outcomes include a clearer understanding of geographical giftedness and practical recommendations for educators. The study discusses the role of Geography Olympiads as a platform for identifying and nurturing talent, emphasising their potential to stimulate critical thinking, spatial reasoning, and problem-solving skills. Furthermore, it advocates for integrating advanced map skills and inquiry-based learning into educational programs to better support these students. By addressing the theoretical foundations and practical applications of geographical giftedness, this research contributes to the development of pedagogical strategies that enable gifted students to maximise their potential. It underscores the importance of tailored educational interventions in fostering critical thinking and spatial awareness, skills essential for tackling complex environmental and societal challenges in the 21st century.

A model for teaching quality in geography lessons

Rainer **Mehren**

The question of the characteristics of quality geography teaching is important, but not easy to answer. Ideas about teaching quality can be communicated and negotiated through models. In the lecture, such a model of teaching quality in geography will be presented and discussed. The model comprises the six basic dimensions: a) effective classroom management, b) subject-related structure, c) cognitive stimulation potential, d) subject-related quality, e) social-emotional support and f) adaptive content-related support. The didactic model is based on generic models such as the Deep Structure Model or the CLASS model (Classroom Assessment Scoring System). The model is supplemented by an observation sheet that can be used both in research and in teaching.

Geography Teachers' interest in professional development

Melissa **Meurel**

Professional development (PD) programs play a crucial role in the continuous professionalisation of teachers, enabling them to address evolving educational challenges. The Offer-Use Model (Lipowsky, 2010) highlights the complexity of PD participation and its impact. While teachers are generally obligated to engage in PD, the extent of participation is often left to individual discretion. In Germany, engagement in PD is relatively low, averaging one event per year, and many PD programs fail to align with evidence-based quality standards or teachers' specific needs. Assessing teachers' interests in PD is a key factor in increasing both participation and effectiveness. This study aims to identify geography teachers' interests in PD content and activities and to analyse factors influencing their engagement, drawing on the educational-psychological theory of interest according to Krapp & Prenzel (2011). Using an exploratory research design, a qualitative pre-study (N=8, semi-structured interviews) informed the development of a questionnaire for a subsequent quantitative survey (N=172, online survey). Interest was measured using a five-point Likert scale, and data were analysed through descriptive and inferential statistical methods in SPSS. Findings indicate a generally high interest in subject-specific PD (M=3.98), with preferences for curriculum-related topics such as urban studies, population, and climate change. Application-oriented activities (e.g., fieldwork) were rated higher than media-based methods. Strongest interest was observed in didactic topics such as digitalisation, excursions, and Education for Sustainable Development, whereas lesson planning received lower ratings. Regression analysis shows that teachers' beliefs about PD explain 35.9% of the variance in interest (adjusted $R^2 = .359$), with subject interest ($\beta = .280$) and professional workload ($\beta = -.159$) as additional predictors. Cluster analysis identified three distinct teacher profiles based on PD interest. The results highlight a discrepancy between teachers' interests and research-based PD effectiveness, suggesting the need for a balanced approach that integrates policy goals, evidence-based standards, and teacher preferences. Implications include considering teachers' (non-)interest when designing PD programs, fostering an interest-driven PD culture, and promoting learner-centred frameworks. Expanding the study internationally could provide comparative insights into geography teachers' PD interests across different education systems.

Enhancing geography undergraduates' spatial thinking capabilities with Multimodal Large Language Models (MLLMs): A Mixed-Methods Approach

Xin **Miao**, Yushan Duan

A critical task for geographers in higher education is to educate the next generation of geography teachers and researchers. Given that geographic data is inherently spatial and spatial thinking is central to the discipline of geography, enhancing spatial thinking capabilities is fundamental. In the context of the Fourth and Fifth Industrial Revolutions, where AI and other advanced technologies have been transforming teaching and learning (Lee et al., 2025; Duan &Lu, 2025), this study investigates how MLLMs can enhance spatial thinking capabilities among Chinese geography undergraduates. This research begins by defining spatial thinking through a scoping review of the literature. It then outlines the participant students' initial spatial thinking capabilities using a combination of drawings and walking interviews. The research team collaborates with existing MLLMs to identify gaps between the students' existing spatial thinking patterns and the ideal spatial thinking as described in the literature. Personalised AI-enhanced interventions are introduced to the participants to help them reach their full spatial thinking potential. Following the interventions, the participants students complete another drawing task and a walking interview to assess the impact of the interventions. The innovative use of a mixed-methods approach, combining quantitative, qualitative, and post-human methods, aims to bring new perspectives to geography education research. The blurring of boundaries between human and non-human researchers/participants challenges traditional research ethics and encourages a forward-thinking orientation for learning geography. This study also holds reflexive value for geography teacher educators, providing insights into teaching geography in higher education with advanced technologies.

An analysis of the teachability of synoptic weather maps in Grade 12 textbooks

Jacobus **Minnie**, Clinton van der Merwe

This study analyses the teachability of synoptic weather maps within the seven Geography Grade 12 textbooks used in South African schools. The study aims to determine the effectiveness of these textbooks as educational tools for this aspect of the Grade 12 Geography curriculum. The research is motivated by the researcher's ten years of experience as a Geography teacher and National Senior Certificate (NSC) marker, which suggests that learners often struggle with interpreting synoptic weather maps. This is contextualised by the limited time allocated to incorporating synoptic weather maps in the Curriculum and Assessment Policy Statement (CAPS). The study adopts a mixed-method research methodology, using content analysis of the learner textbooks. A conceptual framework, integrating Pedagogical Content Knowledge (PCK), Visual Literacy (VL), and Spatial Literacies (SL), will be used to evaluate the teachability of the selected textbook sections. This framework acknowledges the importance of subject matter content knowledge, pedagogical strategies, understanding learners, visual interpretation, and spatial thinking in effective geography education. The research addresses several questions concerning the adequacy of content, how textbooks empower teachers, the promotion of teaching and learning processes, and the alignment of textbook content with CAPS learning outcomes. A measuring instrument, consisting of 23 evaluative questions compiled into a rubric based on the conceptual framework, was developed by the researcher and applied to each textbook. The findings from this analysis will provide insights into the strengths and weaknesses of the current Grade 12 Geography textbooks in effectively conveying the concepts and skills related to synoptic weather maps, ultimately contributing to a better understanding of textbook teachability in the context of the South African curriculum, today for tomorrow.

Success in Geography Education: Efforts at work across the globe

Jerry **Mitchell**

This presentation focuses on an upcoming book - International Perspectives on Geography Education (Edward Elgar, 2026) - that highlights the actions taken by geography educators who work to improve the teaching and learning of geographic content. Much that is published in geography education today is pessimistic and bemoans the status of the discipline compared to other academic areas, the difficulty in training quality geography teachers, and the poor performance of students with the subject's content and skills (such as map reading, analysis, and construction). While these challenges are certainly present, this book seeks to highlight the successes seen in three main areas: student learning, teacher preparation, and teacher professional development. The book is, therefore, one that is positive, optimistic, and showcases for the reader actions that are worth emulating in other places. The presenter will share the successes of authors representing Australia, Belize, Brazil, Chile, Czechia, Germany, South Africa, Singapore, and the United States.

The effect of 3D models' usage on students' conceptual understanding of contours

Oldřich **Mokruša**, Martin Hanus, Lenka Krajňáková

With the ongoing digitalisation of education, there is a growing emphasis on integrating modern technologies and innovative methods into teaching. In this context, 3D printing is often highlighted as a promising tool for enhancing students' skills and enriching the learning experience. As a result, 3D printing is also utilised in primary and secondary schools to teach geography. The educational potential of 3D printing and the 3D models produced may lie in their ability to support conceptual understanding, facilitate conceptual change, and refute misconceptions in geography. This paper presents the research results that aim to empirically demonstrate whether and to what extent 3D models contribute to upper-secondary students' 'conceptual understanding of contours and their confidence in this understanding. It also investigates how the effect of 3D printed models varies depending on the tested propositional knowledge about contours. To explore this, a pre- and post-teaching conceptual test was used to measure the level of students' understanding and response certainty in tasks focused on the concept of contours on maps. This testing was complemented by an educational intervention, where students in two upper-secondary school classes worked in groups with 3D printed terrain models. The results indicate a significant positive effect of 3D model-based instructions on students' conceptual understanding and certainty in test answers. Notwithstanding, the study also identifies certain limitations in their use. This research provides useful insights for pedagogical practice and highlights the potential of using modern technologies such as 3D printing to support the teaching of geography.

The impact of social representations on landscape training in future early childhood education teachers

Diego García **Monteagudo**, Gema Sánchez-Emeterio, Cristina Honrubia Montesinos

Social representations of the landscape play a fundamental role in geography education, especially in Early Childhood Education, where meaning construction influences the perception and understanding of the environment. Understanding how future teachers perceive the landscape is key to developing didactic strategies that promote a more integrated and engaged perspective on socio-environmental issues. The aim of this study was to analyse the impact of social representations of the landscape on the training of future Early Childhood Education teachers. To achieve this, a quasi-experimental design was used, with an experimental group of 59 students who were given a qualitative pre- and post-test instrument consisting of four open-ended questions before and after a didactic intervention. The results were analysed using the structural approach to social representations to identify the elements that structure these representations, with Evocation 2005 software. The pretest results revealed an idealised conception of the landscape, focused on natural elements such as trees, rivers, and water, with marginal references to animals and other intermediate components (flowers). In the peripheral elements, the notion of the countryside predominated, linked to literary and artistic references, which was reflected in the students' drawings. After the training, a significant change was observed in the post-test representations, incorporating anthropic elements such as buildings and people, which had previously been scarcely present. This suggests an evolution toward a more holistic and integrated vision of the landscape, where natural and human factors coexist, although the latter still occupy a secondary position. These findings highlight the importance of teacher training in fostering a broader and more realistic conception of the landscape, which is essential for teaching geography education in early childhood. Keywords: Landscape, social representations, teacher training.

A Transformative Geographical and Environmental education that equips citizens: Effective strategies for promoting a resilient and Sustainable education for Today and Tomorrow

Neo **Moruthane**

The development of a resilient and sustainable future for Geographical learning will explore innovative approaches for education, creating a more sustainable and equitable future for all. This study will unfold how ‘Geographical Learning Today for Tomorrow' plays a transformative role in shaping a better world. The numerous challenges faced by the world today require transformative education to equip future generations with the necessary skills and knowledge. Historically, education has played a role in shaping the responses to these challenges, but its imperfections have contributed to detrimental transformations. To address this, educators and students must be exposed to innovative strategies, pedagogies, and modern technologies. This research focuses on developing transformative education in geography and environmental education, spanning early childhood education to tertiary education and professional workmanship. The study will explore best practices in schools, industries and educational institutions, ensuring that everyone, from the foundation level of education to the professional level of fields (or careers), is equipped with modern or transformative learning skills.

The Impact of English as a medium of instruction on teaching education for sustainable development to English second language Geography learners.

Sabelo **Mtsweni**

This qualitative study aims to explore challenges faced by geography English second language learners when taught Education for sustainable development using English medium of instruction, with the aim to identify effective teaching strategies that can improve the effectiveness of English medium of instruction (EMI) in delivering education for sustainable development (ESD) to English second language learners. Lastly, the study investigates how EMI influences learners' understanding of sustainable development concepts in secondary school. Despite South Africa's language in education policy committing to encouraging the use of all 11 official languages in teaching and learning, the Language in Education Policy (1997) continues to encourage the use of EMI from grade 4 onwards. The hegemony of English as a medium of instruction in many South African secondary schools continues to be evident. This raises concerns about whether EMI has the potential to improve learners' understanding of ESD or if it is a contributing factor towards learners not being able to develop an understanding of the concept. The study employs action research methodology, and the data generation utilised includes semi-structured interviews, focus groups and classroom observations. Participants for the study will be purposively selected, and the generated data will be analysed thematically. The anticipated findings of the study will reveal a correlation between EMI and language challenges faced by English second language learners, such as passive classroom participation and Limited language proficiency amongst geography learners and teachers. Therefore, limited language proficiency could contribute towards a poor understanding of sustainable development concepts. Furthermore, the study anticipates finding effective teaching strategies that are implemented by geography teachers when teaching ESD through EMI to improve English second language learners' understanding of sustainable development.

The Neoliberal Framing of Economic Geography in FET CAPS: Perpetuating South Africa's Role as a Primary Commodity Exporter?

Shaylen **Naidoo**

This study critically examines the framing of economic geography in South Africa's Geography Further Education and Training Phase Curriculum and Assessment Policy Statement (FET CAPS), highlighting its alignment with neoliberal ideologies. The research explores how the curriculum reflects South Africa's historical and contemporary role as a primary commodity exporter, a position shaped by colonial and apartheid legacies and perpetuated by global economic systems. Through qualitative content analysis, guided by critical pedagogy and dependency theory, this study reveals that the curriculum predominantly presents descriptive content rather than fostering critical engagement with geographic and economic systems. Key findings include the absence of historical contextualisation, the omission of alternative economic models, and limited opportunities for learners to critically explore systemic inequalities. The paper argues that this neoliberal framing risks perpetuating South Africa's economic marginalisation and calls for transformative curriculum reforms. These reforms should embrace non-neoliberal, critical pedagogies that promote a deeper understanding of geographical systems, sustainability, and equity, empowering learners to engage meaningfully with the pressing global challenges of today and tomorrow.

Exploring Non-Representational Theory in the South African Geography Further Education and Training Phase Curriculum and Assessment Policy Statement

Shaylen **Naidoo**

The South African Geography Further Education and Training Phase (FET) Curriculum and Assessment Policy Statement (CAPS) predominantly relies on representational approaches to geography education. Non-Representational Theory (NRT) emphasises embodied, performative, and experiential learning. This study examines the extent to which the Geography FET CAPS aligns with NRT principles and explores its potential for fostering a more dynamic, inclusive, and contextually relevant approach to geography education. Setting: The research involves a critical analysis of the Geography FET CAPS document, focusing on its content, pedagogical framework, and assessment methods. A qualitative document analysis using thematic coding to assess the curriculum's integration of NRT principles. While some active learning strategies are present, the curriculum remains largely representational, with limited opportunities for embodied learning and performative engagement. A rigid assessment framework further restricts NRT-aligned pedagogies. The study highlights the need to move beyond static representations of geography towards a more experiential and participatory model of learning. Integrating NRT principles could enhance learners' engagement with space and place, fostering a deeper and more inclusive understanding of geography. This research highlights the need for curriculum reform to integrate NRT, fostering a more dynamic and inclusive approach to geography education.

Fostering ethical competence amongst geography students through an interdisciplinary approach

Krystle **Ontong**

Climate change represents a profound and accelerating threat to planetary systems, requiring multifaceted and interdisciplinary responses. Contemporary geography education serves as a critical conduit for developing spatial literacy and fostering the competencies necessary for environmental stewardship and climate resilience. However, university educators often approach complex, interdisciplinary issues from a single-disciplinary perspective, limiting their effectiveness. The key question, then, is: How can we prepare students for a more effective ethical response to the environment, including themselves and others? This paper proposes an interdisciplinary framework grounded in Place-Based Education (PBE), integrating Environmental Ethics (EE) and geography to strengthen students' ethical competence in responding to environmental challenges. Place-Based Education/ PBE offers a conducive avenue for connecting these disciplines in fostering holistic thinking by merging ethical reasoning with spatial awareness. PBE recognises that environmental ethical dilemmas are situated within specific cultural, economic, and ecological contexts, which enable students to assess competing values, recognise ethical trade-offs, and propose informed, place-based solutions to global issues. EE, a philosophical discipline, examines the moral relationship between humans and the environment, while geography explores the spatial and temporal dimensions of environmental issues. EE also considers responsible personal conduct regarding natural landscapes, resources, and non-human organisms. The application of ethical theories, such as bio/eco-centrism studied through the lens of place theory, within geographic inquiry encourages students to consider both the intrinsic value of nature and the socio-political structures shaping ethical decision-making. This theoretical paper outlines an interdisciplinary approach and will be piloted as part of a broader research project to explore its practical application and effectiveness.

Enhancing Oracy Skills in Geography Education: Strategies for Effective Communication and Deeper Learning

Krystle **Ontong**, Koketso Khule

As an interdisciplinary subject, Geography requires students to understand complex spatial relationships, apply abstract concepts to real-world contexts and interpret and articulate findings extracted from diverse data sources effectively. Various scholars contend that oracy is paramount in fostering critical thinking amongst students through analysis, evaluation, and the collaborative generation of knowledge. Discussions and debates in geography education are pivotal to ensure that students understand the subject matter adequately to make and take responsible and ethical decisions and actions. However, this is often not possible for students who are not native English and/or Afrikaans speakers and who struggle with articulating themselves fluently in one of these languages. This paper highlights a broader study which sought to understand the link between performativity and the phasing out of geography in selected high schools in the North West province. Geography teachers, deputy principals and subject education specialists (SESs) were interviewed. Amongst other factors, language of learning and teaching (LoLT) was identified as one of the factors causing low performance and decreased enrolment in the schools that formed part of the study. We argue that robust interventions in technology, language policy, curriculum, assessment models, and multilingual resources should be considered as key strategies for supporting Geography students whose first language is neither English nor Afrikaans. We offer practical recommendations for geography in-service teachers and student teachers to consider as they navigate these challenges.

Research on the implementation of dual carbon education integration in high school Geography curriculum in China

Jing **Qian**

This study explores the implementation of integrating Dual Carbon Education into high school geography curriculum in China, using methods such as Content Analysis, Comparative Study, and Pedagogical Experiment. China's commitment to carbon peaking by 2030 and carbon neutrality by 2060, announced in 2020, is a national priority. High school geography, focusing on human-environment systems, offers an ideal platform for this education. UNESCO also highlights the role of geography in climate education. However, due to the college-entrance exam pressure, most high school geography teaching emphasises exam skills, although economically developed regions have more resources for dual-carbon education integration. Existing research mainly targets higher education, with only 12.3% of relevant CNKI-indexed papers (2015 - 2023) covering K-12. This study aims to fill the gap by proposing a discipline-specific integration framework, designing evidence-based teaching strategies, and establishing a multidimensional evaluation system. It also constructs a more practical theoretical framework for regions with different economic backgrounds. Moreover, it provides an operable plan for cultivating the "outlook on human-environment harmony", solves the separation between dual-carbon and geography teaching, and improves the environmental education theoretical system.

Linking the South African Geography school curriculum with education for Sustainable Development

Mulalo **Rabumbulu**, Thea Schoeman

The South African school curriculum is increasingly centred on the Sustainable Development Goals (SDGs) and Education for Sustainable Development (ESD). This is represented in the Curriculum and Assessment Policy Statement (CAPS), which applies ESD concepts and approaches to a variety of subjects, including geography. The curriculum seeks to provide pupils with the information, skills, and attitudes required to address global issues and promote sustainable lifestyles. At the basic education level, environmental and sustainability education are integrated as a principle underpinning the national school curriculum. All 17 SDGs are included in the topic knowledge specified for various grades and subjects. Understanding and acquiring geographic knowledge and applying sustainability principles are determined not only by the subject matter itself but also by how it is taught and studied. Our study investigates the teacher's level of competency in teaching sustainability themes before and after the training. 238 geography teachers from Gauteng province in South Africa attended short learning programs (SLPs) at the University of Johannesburg to improve their skills in climatology (n=33), geomorphology (n=39), and mapwork (n=166). Some of the themes covered in the SLPs are directly relevant to sustainability. Following the training, the teachers completed a questionnaire to evaluate the SLPs, which included a part for self-evaluation of their level of proficiency in the themes before and after the training. SDG 13 advocates for immediate action to prevent climate change and its consequences. Climate change is a significant global concern, and understanding it can help achieve sustainable development. Before the training, 64.5% of teachers considered themselves proficient in this issue, which improved to 90.3% after the training. SDGs 11 and 13 primarily address sustainable flood and river management. Before the training, slightly more than half (52.7%) of instructors rated themselves competent in flood and river management. This increased from 39.4% to 92.1% following the training. Our results indicate that the teacher’s training programme was instrumental in improving teacher competence and confidence in teaching skills associated with sustainability, and this, in turn, will be passed on to the school learners.

Artificial Intelligence and Geography Education: Enhancing Geographical Thinking and Water Awareness in Primary Education

Gema **Sánchez-Emeterio**, Honrubia Montesinos, Cristina, García-Monteagudo, Diego

Artificial Intelligence (AI) is increasingly being integrated into education, demonstrating its potential to enhance learning by adapting content to students' realities, thus fostering meaningful learning. Scientific evidence suggests that traditional materials, such as textbooks, often fail to engage students, as they do not establish a connection between academic content and their everyday experiences. This disconnect can hinder geographical thinking and environmental awareness, two critical components of geography education today. This study aims to analyse the impact of AI-generated materials on geographical thinking and water awareness in primary education, comparing them with traditional textbook-based instruction. A quasi-experimental design was implemented with two groups of 4th-grade primary education students (N=50). The experimental group (n=25) was used. AI-designed materials were used, while the control group (n=25) continued learning through textbooks. Pre-test and post-test assessments were conducted to measure students' geographical thinking and awareness of water-related issues. Findings indicate that students in the experimental group showed significant improvements in both geographical thinking and water awareness compared to the control group. The results highlight the potential of AI-based materials to make learning more engaging and contextually relevant. This study underscores the transformative role of AI in geography education, demonstrating how AI-generated materials, by being more connected to students' lived experiences, can enhance geographical thinking and environmental awareness. The research contributes to the discourse on innovative and technology-integrated pedagogies, fostering sustainable and globally relevant geographical education practices.

Fostering Responsible Consumer Behaviour: Insights from the Re3PriS Project on Sustainable Consumption Education

Daniela **Schmeinck**

Consumer behaviour is influenced by a variety of factors, including advertising, communication, personal preferences, habits, and even spontaneous incentives. Due to their considerable purchasing power and future customer potential, children and adolescents represent a key target group for marketing strategies. Therefore, it is essential to introduce them to responsible consumerism at an early age. Consumer education in schools plays a crucial role in promoting responsible and sustainable consumption patterns from primary school onwards. The Re3PriS project aims to empower students and their families to make informed consumption choices by developing teaching concepts that seamlessly integrate into European curricula. The project follows a three-year cycle, focusing on reduce, reuse, and recycle as key principles of responsible consumption. In its first year, the project has concentrated on the Reduce aspect, developing educational materials on topics such as waste reduction, CO_2 reduction, fast fashion awareness, water conservation, and emissions reduction. These educational concepts help children understand the importance of resource efficiency and waste minimisation and foster environmental awareness from an early age. To evaluate the impact of these interventions, the project employed a quasi-experimental pre-post research design. Partially standardised questionnaires were administered to children and their parents in four European countries before and after each of the two interventions. This approach enabled the collection of both quantitative and qualitative data on changes in knowledge, attitudes, and behaviours related to sustainable consumption. This presentation will provide insights into the initial research and teaching strategies developed. It will showcase selected classroom activities designed to promote sustainable consumption, encourage critical thinking, and instil values of environmental stewardship and economic awareness. Additionally, it will assess the effectiveness of these activities in partner schools to evaluate their impact on students' consumer behaviour. By integrating consumer education into the curriculum in a meaningful and sustainable way, the Re3PriS project contributes to Education for Sustainable Development (ESD) and equips children with the knowledge and skills necessary to make responsible consumption decisions. The results from the first year will serve as a foundation for the next phases of the project, which will focus on reuse and recycling.

Rethinking the origins of teaching expertise: Insight from expert Geography teachers in Germany

Nina **Scholten**, Nicole Masaneki & Isabel Höyng

In the German teacher education system, professional knowledge—encompassing content knowledge, pedagogical content knowledge, and pedagogical components—is widely regarded as the central pillar of teacher professionalism. This foundational view assumes a linear progression from professional/academic knowledge acquired during university studies to competent teaching practice. However, recent empirical and theoretical work challenges this assumption, suggesting that expertise in teaching emerges not solely from formal knowledge acquisition. Neuweg (2020), for instance, argues that crucial elements of teaching proficiency are often learned "through experience and example, by modelling and communities of practice" (p. 765). Building on this premise, the present study investigates the origins and learning opportunities that contribute to classroom teaching expertise. Employing a qualitative research design, we conducted semi-structured, two-tier interviews with seven expert geography teachers. The initial open-ended phase encouraged participants to reflect freely on how they became experts in classroom practice, followed by more structured prompts addressing influential practices, resources, individuals, and extra-curricular experiences. The ongoing analysis applies a deductive-inductive approach grounded in Qualitative Content Analysis. Preliminary findings reveal that teaching expertise is shaped through a diverse range of formal and informal learning opportunities. The results will be finalised by the time of the conference. This research contributes to broadening the often-narrow focus on university-based professional knowledge in teacher education. It forms part of an interdisciplinary study that includes a parallel investigation with expert German language teachers (n=5), enabling comparative insights across subject areas. The findings carry significant implications for teacher education, particularly in re-evaluating how we conceptualise and support the development of teaching expertise in geography education and beyond.

Fostering global citizenship and environmental stewardship with assisted reality

Veronika **Selbach**, Johanna Mäsgen

The paper will introduce an upcoming project between the Department of Geography, Cologne, Germany and Bharati Vidyapeeth Deemed University, Pune, India, in cooperation with the Centre for Sustainable Technologies, Bangalore, India. Didactically, the project focuses on two key aspects. First, it promotes global citizenship and environmental stewardship in response to increasing internationalisation and global challenges. Second, it fosters digital literacy, acknowledging the growing significance of assisted reality in a globalised society and addressing the associated challenges. Through global citizenship, the participants of the project are to be enabled to become transnational world citizens in a cosmopolitan understanding of international citizenship. This is achieved through a cooperative approach, emphasising partnership and learning with, from and for each other. The goal is to enable participants to take responsibility for global challenges and actively contribute to their solutions. Key aspects of this approach include the understanding that global challenges can only be addressed through international cooperation and that there is always a transfer from the local to the global level. This is particularly significant in the context of transcultural cooperation between the participating project partners from India and Germany. Environmental stewardship is another core principle addressed in the project. The participants collaboratively acquire, contribute to, and develop expertise in relation to environmental issues. To enhance digital literacy, the project emphasises the use of assisted reality in terms of using smart glasses. The focus is on training communication and learning together via smart glasses by means of common excursions (live and recorded). Implementing this approach enables project partners to enhance technological literacy in work settings and everyday life. To this end, a training programme is provided, teaching participants how to use the technical devices both effectively and smartly.

Nature connectedness as an alternative discourse in Singapore's climate transition

Tricia **Seow**

Singapore is a low-lying tropical city-state with a high population density and limited land area, making it vulnerable to the impacts of climate change, including sea-level rise, flooding, and heat stress. As a more developed country in Southeast Asia, Singapore also has a responsibility to its region and the international community to transform its society, shifting from a culture of consumption and growth to one of sustainability and stewardship. This requires fundamental changes in individual behaviours, community norms, and societal values, which must be supported by education. This presentation evaluates the concept of nature-connectedness and its value within education by situating it in contrast to larger state-sanctioned plans for adapting to and mitigating climate challenges, particularly the Singapore Green Plan and the Eco-Stewardship Programme. It assesses the structure and goals of the national curriculum and its recommended pedagogies for meeting these goals, with particular focus on Geography as a school subject. Finally, the presentation argues for a focus on nature-connectedness to address current gaps in the system and to provide possible alternative pathways for thinking about education's role in shaping a climate-resilient and sustainable society.

Curriculum-activated Change Project approach for climate action and sustainability practice in schools

Arorisoe **Sibanda**, Heila Lotz-Sisitka, Wilma van Staden, John Bhurekeni, Shanu Misser, Rob O'Donoghue and Noncaba Khumalo

In Geography and Social Sciences Education, curriculum innovations are needed that can mobilise indigenous knowledges, learners' living heritage, and responses to sustainability challenges (e.g. climate actions) as these are often excluded from formal curricula. This can potentially help to address a misalignment in formal education programmes and the life worlds of the learners. Our study addresses this problem through offering curriculum innovation strategies using a dialectical learning process and an expansive learning methodology. We draw examples from formative intervention processes which focused on 1) leveraging expansive learning through online teacher education, and through this, 2) supporting teachers in schools to co-develop ESD curriculum-activated change projects (ESD CACPs) with other teachers, communities and learners. This includes teachers using story-sharing methodologies and climate action projects of various kinds in response to sustainability challenges. Available data from several completed ESD CACPs from two projects: the national Fundisa for Change programme's work on climate change education (20 CCE CACPs), and the UNESCO Sustainability Starts with Teachers programme (20 ESD CACPs) demonstrates a grounded model for ESD that integrates culture as foundation for transformative learning in Geography and related subjects. The CACPs reveal a dialectics of transformation for mediating ethics-led learning and change in and out of teaching practice; also mobilising the dialectic between curriculum and life-world. In conclusion, we propose that ESD CACPs offer a curriculum innovation strategy to address curriculum exclusions while advancing diversity in reasoning and praxis as the cornerstone for collaborative and inclusive teaching methods. This further reveals that transformative learning in Geography Education and Social Studies curricula could be constituted as emerging processes which occur through mediated expansive learning actions that are educative and catalytic of agentive action with resonance to the lifeworld of learners, with climate action and sustainability practices outcomes in schools and communities.

The effects of microteaching on preservice teachers' self-efficacy in teaching mapwork

Muofhe **Thenga**

The Department of Basic Education (DBE) National Senior Certificate (NSC) Diagnostic Reports from 2020 to 2024 consistently highlight poor performance in mapwork among Grade 12 geography learners. A key issue identified is that students often fail to use topographical and orthophoto maps when answering questions, suggesting that teachers may lack the necessary expertise to teach mapwork effectively. This challenge extends beyond South Africa to other Southern African nations, underscoring the need for better teacher preparation in mapwork. To address this gap, preservice geography teachers must develop strong mapwork teaching skills in their methodology courses. Microteaching has been widely recognised as an effective pedagogical tool in teacher preparation programs, yet little research exists on its impact on preservice teachers' self-efficacy in teaching mapwork. This study aims to examine the influences of microteaching on the preservice geography teachers' self-efficacy in teaching mapwork. Grounded in Bandura's self-efficacy theory (1977), the research will use a mixed-methods approach, integrating pre- and post-surveys, peer observation feedback, and student reflections. By assessing these data sources, the study seeks to assess changes in preservice teachers' confidence and competence in delivering mapwork instruction in secondary schools.

Future-focused? Reflections on PBL Practices in Secondary School Geography Classrooms

Angela C. **Phocas**, Clinton van der Merwe

Problem-based learning (PBL) has long been established in Higher Education practice as a valuable and dynamic method of teaching and learning, and its value to contemporary education continues to play a critical role. PBL is widely recognised for fostering critical thinking, collaborative, and self-directed learning grounded in real-world problems. Geography is uniquely positioned to offer a learner-centred approach that fosters analytical and transformative thinking relevant to a dynamic global future. However, PBL remains under-researched at the school level, particularly within South African geography education, resulting in limited guidance for teachers on how to implement learner-centred approaches within existing curricular frameworks effectively. This paper investigates and reflects on the use of PBL in secondary school geography classes. The study utilised a mixed-methods approach by combining Likert-scale questionnaires to Grade 8 learners (n=153) and Grade 10 learners (n=45) and semi-structured interviews with geography educators (n=3) to elicit nuanced understandings. By examining both learner perceptions and educator experiences, the research reveals how PBL fosters a more learner-centred environment and enhances active participation in geography lessons. While learners stated increased motivation and opportunities to solve real-world problems, educators highlighted educational benefits such as enhanced engagement and improved collaboration. Furthermore, the results revealed that the practical challenges of implementing PBL—particularly within the constraints of curriculum pacing and assessment requirements—can be effectively addressed through timely planning, structured scaffolding, and sustained professional development. It concludes with implications and recommendations for professional development and curriculum design, thus positioning PBL as a viable strategy for equipping learners with the competencies required for a complex and uncertain future.

Transformative Education in teacher training: The potential of field trips to foster reflexivity in addressing global inequality structures

Jonas **Wagener**, Andreas Eberth

The transformation of worldviews and critically reflecting on one's positionality in the world are essential elements of what we understand as transformative geography education. Future teachers have a crucial role to play, as they will either reproduce or – hopefully – critically question stereotypes and promote diverse or new perspectives on our world in their future classrooms. The aim is not only to expand knowledge, skills and abilities, but to qualitatively change self-perceptions and world views through a reflective examination of self and world relations. The presentation is based on a geographical field trip to Kenya in 2024, where teacher training students from Germany travelled together with Kenyans for three weeks. During the trip, the group intensively reflected on geographical imaginations and their perspectives, for example regarding ideas of development, dealing with the colonial age, global inequalities and individual stereotypes before the trip. The research design of the qualitative survey includes focus group discussions before and after the trip, as well as questionnaires and a photo voice exercise during the trip. In this presentation, results and findings on the potential of geographical field trips to foster Transformative and Global Education will be shared. Based on empirical data, the importance of critical and reflexive thinking in teacher training programs will be emphasised. Finally, implications for reflexive and decolonial field trip practices are presented and discussed: We argue for important paradigm shifts: from an intercultural to a transcultural educational approach, to shift binary geographies and to value the inspiring in-between and intersectional thinking through a deconstruction of Eurocentrism.

Utilising Grade 4 learners' lived experiences to explore places where people live

Tiani **Wepener**

Geographical learning in primary education should bridge the gap between formal curriculum content and learners' lived experiences. This study presents an innovative approach that integrates learners' prior knowledge and personal experiences into Geography education, using a structured lesson plan focused on the topic Places Where People Live in the South African Grade 4 Social Sciences curriculum. By employing experiential learning techniques, the study emphasises the significance of lived experiences in fostering geographical consciousness. The methodology involves engaging learners in observation, reflection, and mapping activities that deepen their understanding of human settlements and spatial patterns. Using Gibbs' Reflective Cycle, learners analyse their interactions with their surroundings, enhancing their ability to assess their environment critically. Through journaling, sensory engagement, and community exploration, learners actively construct knowledge about jobs, buildings, and the social and economic functions of different places. Findings suggest that integrating personal lived experiences into Geography lessons enhances learners' curiosity, observational skills, and spatial awareness. The activities allow for meaningful engagement with content while reinforcing key geographical skills such as data collection, classification, and interpretation. The study highlights how hands-on, minds-on activities encourage learners to connect real-world phenomena with academic content, making Geography more relevant and sustainable in an era of rapid technological advancement. This research contributes to contemporary geographical education discourse by advocating for a shift from didactic instruction to learner-centred, experiential approaches. The findings underscore the importance of recognising learners as active agents in knowledge construction, thereby improving their ability to relate to and critically engage with their environment. The study provides valuable insights into fostering geographical consciousness in young learners, ensuring that Geography education remains meaningful and impactful for future generations.

GIS-T: Teaching about Climate change with the help of Geographic Information Systems (GIS)

Sophie **Wilson**, GIS-T Erasmus+ partners

GIS-T: Teaching about climate change with the help of Geographic Information Systems (GIS) in a world increasingly characterised by rapid change, risk, and vulnerability, geographical education must equip young people, teachers, and teacher educators with the skills and knowledge to navigate complex global challenges. The GIS-T project demonstrates how Geographic Information Systems (GIS) can be integrated into the school curriculum to foster locally responsive yet globally relevant geographical learning, particularly in the context of climate change. This session will explore how GIS technology enables students to analyse climate as an interconnected system, engage with real-time environmental data, and develop strategies for climate adaptation and mitigation. By using data from leading scientific organisations, the project promotes the use of GIS as an educational tool, enhancing both teachers' and students' critical thinking and spatial reasoning skills by giving them the confidence to explore credible climate science confidently. Recognising the transformative potential of technology in education, the session will highlight innovative pedagogies that promote enquiry-based learning and student agency in addressing climate challenges. Participants will engage with interactive examples demonstrating how GIS can bridge the gap between geographical concepts and real-world applications, fostering deeper understanding and local engagement. The session will conclude with an introduction to the GIS-T curriculum hub, a digital resource centre and an online teaching course offering lesson plans and case studies, designed to support educators in integrating GIS into their practice. By aligning technological innovation with sustainability education, GIS-T contributes to a more future-oriented geographical curriculum that prepares learners to act as informed global citizens.

Is or can Transformative Learning be embedded in Geography textbooks?

Sophie **Wilson**, Bednarz, S. W., Fatima, M., Garcia de la Vega, A., Grob, R., Mäsgen, J., Wilmot, D.

This paper explores the potential for embedding transformative learning (TL) into geography textbooks and other teaching and learning materials. Recent research examined literature to identify how TL is conceptualised and operationalised both as a theory and as a pedagogical process in different national contexts. This was used to propose a working definition of TL and its relevance to geography education, further developed through a selection of case studies centred on the curriculum topic of climate change in different countries. Geography is considered a particularly relevant subject for TL, due to its emphasis on interconnectedness, spatial thinking, and real-world challenges. Building on this research, this paper shares the initial findings of an empirical analysis of teaching and learning materials, and it proposes a framework for designing transformative tasks that support educators in encouraging young people to think critically, question existing ways of seeing the world, and consider alternative perspectives, and act differently. Guided by the framework, the aim is to share examples of good practice to model possible ways of embedding TL in geography teaching. The analysis will highlight opportunities and challenges for making geography lessons more action-oriented and less reliant on content learning. The findings will help to show how geography textbooks and other resources provide key tools for embedding TL principles into the curriculum. This work contributes to the conversation around curriculum innovation, sustainability education, and transformative pedagogies. It is intended to support teachers, teacher educators, and resource developers by offering ideas that are locally grounded yet globally relevant. In doing so, it seeks to strengthen the role of geography education in preparing young people to engage with the socio-ecological challenges of today and tomorrow.

The barriers and enablers of curriculum thinking and teacher agency in geography education: A multinational study

Jayeon **Yang**, Martin Hanus, Emma Rawlings Smith, Uwe Krause, Milton Milaras, Tine Béneker, Radka Flajšhans Nedbalova, Xueying He, Yujing He, Naoyuki Ito

As global environmental, social, and geopolitical crises intensify, there is an urgent need for education systems to foster young people's ability to think geographically and engage critically with the world around them. Geography education has a unique potential to provide this through powerful disciplinary knowledge and higher-order thinking. However, this potential can only be realised if teachers are supported and empowered as curriculum makers. This presentation draws on a multinational research project involving seven national contexts – Czechia, China, England, Japan, the Netherlands, South Africa, and South Korea – to explore the barriers and enablers of teacher agency and curriculum thinking in secondary geography education.
Using Bernstein's pedagogic device as an analytical lens, the study examines how knowledge is produced, recontextualised, and enacted in different education systems. We present a novel comparative framework to assess the extent to which teachers can foster teacher agency and provide students with epistemic access to powerful disciplinary knowledge in school geography. Findings reveal significant variation in teachers' access to subject-specific and pedagogical knowledge, autonomy within curriculum and assessment structures, availability of high-quality resources, and institutional support for professional development.

Despite systemic constraints, examples from all seven contexts illustrate how individual teachers navigate and sometimes challenge these limitations to enact F3 geography curricula. The study also highlights the shared responsibility of stakeholders (i.e., teacher educators, curriculum developers, policymakers, and textbook authors) to support teachers in equipping young people with the critical, analytical, and problem-solving skills necessary to be prepared, navigate, and respond to the polycrisis of our time.

Panel Discussion

Rethinking Praxis for a World of Difference: Findings and Reflections from the 2024 CGE Writing Retreat

Chair: Martin Hanus

Panellists*:* Di Wilmot, Robert Bednarz, Gillian Kidman, Tomáš Bendl, Lenka Krajňáková, Martin Hanus

This panel reflects on the collaborative experience and research outcomes of the 2024 IGU-CGE Writing Retreat, a distinctive initiative designed to foster international mentorship, scholarly inquiry, and inclusive academic development in geography education. Originating from a structured multi-phase process (including collaborative white paper writing, iterative peer feedback, and an intensive in-person retreat during the 2024 IGU-CGE Galway Symposium), the initiative culminated in a special issue of International Research in Geographical and Environmental Education (IRGEE). The published papers engage with timely issues such as geographical thinking in curricula, teachers' agency, resilience education, transformative pedagogy, and the integration of generative AI in geography education. Together, they illuminate critical intersections between curriculum, pedagogy, teacher professionalism, and assessment reform.

The session features five panellists, each representing one of the authoring teams behind the special issue's contributions. Each panellist will reflect on: a) the substantive findings of their group's paper, and b) the professional and networking dimensions of the writing retreat.
Beyond presenting research, this panel critically explores the retreat as a model for international academic collaboration. It examines the benefits and tensions of cross-cultural mentorship, the dynamics of collaborative writing, and the challenge of balancing inclusivity with academic rigour. Panellists will discuss how this process shaped their (and their groups') scholarly identities, broadened epistemological perspectives, and generated research with global relevance.

The panel offers a compelling vision of how international cooperation and intentional mentorship can enhance scholarly quality and build a more diverse, resilient research community. It will interest community members seeking effective models for research development and capacity-building within geography education.

An international perspective on Geography curricula: Paving a way forward for geographical thinking

Chair: Martin Hanus

Panellists: Tomáš Bendl, Hilde Storrøsæter; Lene Møller Madsen; David Trokšiar; Raphaële de la Martinière; Shanshan Liu; Sizakele Serame; Jerry T. Mitchell; Péter Bagoly-Simó; Yushan Duan; and Gillian Kidman

Geographical thinking is a cornerstone of geography education, yet its integration into national curricula has not been systematically examined on a large international scale. This study investigates how geographical thinking is embedded in the curricula of nine countries—Australia, China, Czechia, Denmark, France, Norway, Slovakia, South Africa, and the United States—offering a unique comparative perspective. By analysing curricular documents and gathering qualitative insights from geography education experts across these diverse educational systems, the study provides a comprehensive understanding of how geographical thinking is conceptualised and applied globally. Using a structured analytical framework, the research examines both content and procedural dimensions of geographical thinking. A two-step method ology was employed: first, a deductive content analysis of curriculum documents was conducted using predefined categories, followed by open-ended questions posed to national experts to capture additional qualitative insights. This approach allows for a deeper exploration of how geographical thinking is explicitly or implicitly embedded within different educational curricula. Findings reveal significant patterns and gaps, particularly the underrepresentation of "place" as a central concept, the lack of explicit emphasis on geographical thinking, and the limited focus on its procedural aspects. The study also highlights the tension between prescriptive and interpretative curriculum structures, influencing the extent to which geographical thinking is effectively developed in classrooms.

Workshops

Spatial Thinking: Little taught but essential

Sarah **Bednarz**, Robert S. Bednarz

Spatial thinking is defined as a “constructive amalgam of concepts of space, tools of representation, and processes of reasoning that uses space to structure problems, find answers, and express solutions” (National Research Council, 2006). Spatial thinking is a required skill for learning and doing geography and other sciences. It also serves as the foundation of geospatial technologies such as geographical information systems (GIS). Despite its importance, spatial thinking is not an explicit part of geography, science, or mathematics curricula in schools or universities. It is not taught in a systematic fashion; its acquisition is assumed as an unintended outcome of coursework and life experiences. Spatial thinking is an emerging area of research and interest among GIScientists, geographers, cognitive scientists, and psychologists. This workshop proposes to present participants with opportunities to explore four questions related to spatial thinking: • What is spatial thinking? • Why is spatial thinking important? • How is spatial thinking acquired and developed? • What are the relationships between spatial thinking and geographic thinking? The workshop will be aimed at educators at all levels interested in spatial analysis, problem solving, and communicating ways to use this powerful habit of mind in the practice of geography and related disciplines. A particular focus will be on the ways spatial thinking may be supported by geospatial technologies. Participants will become aware of their own spatial thinking, spatial habits of mind, and concrete strategies to support students in developing their spatial thinking skills.

Conversations with maps: Teaching visual literacy in a digital age

Warren **Boardman-Smith**

This proposal is not based on a "formal academic paper", but rather on my observations and experience from 30 years of practical classroom experience in the teaching of Geography in South Africa and New Zealand. Having taught geography for thirty years, in both prep school and secondary school, in two different countries, and across three different curricula, I have found that there is a single common thread to achieving success in educating spatial understanding, a cornerstone to our subject - visual literacy. As our digital world has evolved over the past twenty years, I have found that young students have increasingly battled to understand their world, especially when being asked to read a map. They have engaged less with the real world and do not “see outside” the window (of the classroom, the car or the aeroplane). Travelling time is no longer an immersive visual experience, but rather, an “audiovisual overdose of social media/entertainment content”. Ask today’s students to use a paper-based map to navigate, and they look perplexed and ask, why? After all, plug your destination in, and Google Maps will simply tell you where to go without you even having to look at a screen. Is our increasingly digital world leading to the “unlearning” of the basic principles of spatial understanding? I propose we focus on reconnecting our students with the world in which they live through the promotion of visual literacy skills - that’s visual literacy in the broadest possible sense, but most importantly, teaching our students to have “conversations with maps”. While embracing new digital technologies, we can still instil the basics that could help us reclaim the essence of Geography - a spatial connection to our world.

AI in Geography Education: Navigating the promise and peril, a critical workshop for 21st-century Geography classrooms

Gillian **Kidman**, Hazel Tan

Artificial Intelligence (AI) is transforming education, offering new opportunities and challenges for school geography. This interactive workshop equips geography teachers with a critical understanding of how AI is currently used in geography education. It also supports them in developing responsible and pedagogically sound applications in their classrooms. The workshop has three core objectives: 1. To build awareness of how AI tools such as ChatGPT, image generators, and predictive models are integrated into educational practice and geography content. 2. To examine the risks and ethical concerns associated with AI, particularly concerning misinformation, fake news, and bias in geographical data. 3. To collaboratively design AI-enhanced teaching strategies that align with the aims of geography education, including spatial thinking, evidence-based reasoning, and critical media literacy. The workshop combines short expert inputs with hands-on group activities. Participants will explore real-world examples of AI-generated geographic content, identifying opportunities and pitfalls. They will then work in small groups to co-develop lesson concepts that integrate AI tools while critically addressing their limitations. A plenary session will provide space for sharing insights and recommendations across groups. By the end of the session, participants will: • Gain a clearer understanding of AI's current and emerging uses in geography education. • Be able to evaluate AI-generated materials for accuracy, bias, and pedagogical value. • Leave with practical ideas and lesson outlines for responsibly incorporating AI tools into their teaching. Ultimately, the workshop fosters a professional community committed to thoughtfully navigating AI and balancing innovation with critical reflection in the geography classroom.

Mapping Assessment Practices: IEB ISC Exit-Level Assessment for Southern African Geography Secondary School Learners

Robyn **Mowatt**, Pam Esterhuysen, Graham Keats

This workshop provides an in-depth exploration of the assessment practices used in the Independent Examinations Board (IEB) International Secondary Certificate (ISC) Geography examination, a cross-border school-leaving qualification for Southern African students. Presenters will contextualise the IEB as an examination body and unpack the structure, content, and intent of both Paper 1 and Paper 2 within the ISC Geography curriculum. Key elements of the examination setting and quality assurance process will be covered, including internal and external moderation, marking guidelines, standardisation procedures, and cognitive demand frameworks.

The workshop will also present ISC performance data, symbol distribution, and candidate demographics since inception, highlighting how the assessment supports diverse contexts while maintaining academic rigour. Opportunities for ongoing teachers' professional development will be discussed. Participants will review recent ISC Geography exam papers and engage in a practical activity focused on analysing and setting questions across a range of cognitive levels. The session will conclude with open discussion and Q&A, offering an opportunity for collaborative reflection on assessment in geography education.

Posters

Literature and Environmental Science in Brazilian Literary Books in Basic Education

Iara Rosa **da Silva Bustos**, Gisa Gasparoto, Elisabete Feitoza

Literature is a privileged expression of human thought, emotions and perception regarding the multiplicity of knowledge and cultural experiences developed in geographic space. In this sense, the creation of reading clubs represents a fruitful pedagogical strategy for expanding the literary repertoire and developing the critical training of basic education students. Since 2019, the Reading Club of the Centro Educacional Pioneiro has developed systematised practices that involve careful selection of works and reflective reading by students of basic education. The process culminates in the presentation of critical summaries, with active participation from the school community. This practice favours the improvement of reading skills, especially those related to textual analysis and the interpretation of works in their aesthetic and symbolic totality. As part of these activities, fourteen works of Brazilian literature have been studied to date, the selection of which dialogues with fundamental categories of geography, such as natural space, landscape, place, region, territory and anthropic changes. It should be noted that Brazil, which has great cultural and ecosystem diversity, faces threats arising from a model of accelerated economic development, marked by industrial and agricultural activities that, on a large scale, harm environmental sustainability. In this scenario, Environmental Science, as a multidisciplinary field dedicated to the analysis of interactions between living beings, the environment and human action, is enriched by dialogue with Literature. Literary narratives allow for the approach to spatial complexity and the problematization of environmental issues, contributing to the formation of critical subjects capable of arguing rigorously about the challenges of sustainable development. The union between Book Club, Environmental Science and Geography categories values the links between the various natural and cultural environments, promoting choices guided by freedom, autonomy, critical awareness and civic responsibility.

Conceptions of geography teaching: Examining the ecological validity of the questionnaire

Petr **Knecht,** Michaela Spurná, Karolína Malíková

Rooted in pragmatic realism, this study addresses current challenges in geography education, specifically: (a) the need for a stronger focus on subject-specific aspects when observing geography teaching, and (b) the necessity of simplifying methodological tools, such as lesson plan templates and observation protocols, used in teacher education. These challenges reflect broader discussions about the quality and relevance of teacher preparation in the social sciences. To tackle these issues, we developed a self-assessment tool available on the Geo4tea.com platform (Geography for Teachers) to identify teachers' preferred conceptions of geography teaching. This study aims to assess the ecological validity of the Geo4tea self-assessment tool—that is, the extent to which the conceptions expressed by the teachers correspond with real classroom practice. The research questions guiding this study are: (1) Is the observation framework derived from the self-assessment questionnaire a valid and reliable tool for observing geography lessons? (2) To what extent does the teaching conception expressed through the self-assessment align with actual classroom practice? The study draws on direct classroom observation data from 29 pre-service and 27 in-service teachers. We evaluated the consistency between self-reported teaching conceptions and observed teaching behaviours using systematic observation and comparative analysis. Findings indicate that the Geo4tea application produces valid data. In-service teachers demonstrated greater alignment between their conceptions expressed in the Geo4tea.com platform and observed practices than pre-service teachers. Moreover, the study revealed low ecological validity in the environmental conception, suggesting difficulties among teachers in translating environmental beliefs into classroom practice. These results highlight the value of conceptually focused diagnostic tools in teacher education and the challenges of achieving coherence between belief and practice. The study contributes to developing targeted support for pre-service and in-service geography teachers and informs the design of simplified, subject-specific evaluation instruments.

Geographical Education Innovation on the Roof of the World: Construction of a Six-Dimensional Integrated Teaching Model Based on the Cordyceps Sinensis Harvesting Culture in Tibet

LiShiBao

Tibet is located in the core area of the Qinghai-Tibet Plateau. Known as the "Roof of the World", its special geographical environment has created natural conditions of high altitude, frigid climate, strong radiation, and hypoxia, and also nurtured the precious Cordyceps sinensis. Every spring and summer, students in rural pastoral areas of Tibet take advantage of the Cordyceps-harvesting vacation to help their families increase income and alleviate poverty. This unique practice poses challenges to the geography education major at Tibet University: how to innovate the conventional teaching mode and develop teaching content that suits the characteristics of Tibet, to integrate it into students' lives. Based on educational anthropology, geography education, and sustainable development theories, this research conducts a six-dimensional integrated innovative teaching mode reform from multiple dimensions, such as educational model, curriculum construction, and normal student cultivation. The aim is to improve the quality and adaptability of geography education in Tibet, promote students' in-depth understanding and practice of the concept of harmonious human-land development, and provide theoretical and practical references for the coordinated progress of education and regional sustainable development in high-altitude areas.

Are our Head Teachers okay? Decision-making processes of Head Teachers in COVID-19 times: Implications for head teachers and independent schools in South Africa.

Julia **Pahl**

The COVID-19 pandemic had an enormous impact on educational programmes within South Africa. This research focused on the impact that the pandemic had on the head teachers (principals) of Independent South African secondary institutions. The centrality of the head teacher in a school places them at the forefront of decision making, guiding professional purpose, managing learning, and developing students and educators. All these actions were brought to the forefront of education during the pandemic. The individuality, decision baselines, and personal impacts associated with leadership decisions were important to consider, as they influenced the decisions made and impacted the success of education during the pandemic. This was researched using online surveys and personal interviews. A core question asked was: has the process of making these rapid, impactful and life-or-death decisions had an impact on the head teacher, have they influenced their educational philosophies and methodologies, and finally have they changed the way head teachers view their job and its characteristics? This poster presentation will present the final findings of this research, namely the implications for head teachers and the lessons learnt for leading during pandemics. The implications for head teachers showed how head teachers experienced increased levels of pressure, stress, and anxiety, increased levels of burnout, and that they had an overall decrease in their well-being as a result of their decision-making actions during the pandemic. The results show how leadership during a pandemic increased the number of resignations and early retirements within the profession in South Africa, and the six lessons to be learnt for future school leaders, within all three levels of leadership – National, Departmental, and Educational.

Teacher Educationists' Perception of Geography ITE Content Structure Inscribed in the Fibonacci Sequence

Michaela **Spurná**, Petr Knecht

This poster presents a study that applies the Fibonacci sequence and the golden ratio as metaphorical tools to analyse the structure and content of geography initial teacher education (ITE) in Czechia. The research draws on 42 in-depth interviews with geography teacher educationists from nine university departments. The aim is to explore how educators of pre-service teachers perceive the real condition of initial teacher education in terms of the arrangement of educational content, and how they believe it should ideally be structured. The goal is to identify a unifying pattern in the organisation of educational content across geography ITE programmes in the Czech Republic. By using the symbolic structure of the Fibonacci sequence, the study proposes a new framework for visualising and interpreting the proportion and balance of various educational components within geography ITE. Findings reveal a latent structural logic in how teacher educationists conceptualise geography ITE: a shift from the dominance of geography subject knowledge towards a more balanced, layered model rooted in general pedagogical knowledge. This reconfiguration suggests an emerging aspiration for proportional coherence. The poster contributes to international discussions on geography teacher education by offering a transferable conceptual approach that may support reflection on curriculum structure, reform, and policy. It invites dialogue on how metaphorical and structural thinking can inform both national debates and comparative international research in geography education.

Enhancing self-directed learning in Geography Education through AI integration: An agentic capability perspective

Kudzayi **Tarisayi**

Geography education in resource-constrained South African township schools faces significant technological access and pedagogical innovation challenges. This ongoing study examines how teachers' agency and capabilities influence the integration of Artificial Intelligence (AI) tools to enhance self-directed learning (SDL) in geography classrooms. Grounded in Agentic Capability Theory and the UNESCO AI Competency Framework for Teachers, our research employs a pragmatic case study approach in two secondary schools in Ikageng township, North-West Province. We explore the interplay between teachers' self-efficacy, autonomy, and institutional support in shaping AI adoption practices through a sequential mixed-methods design. The research examines how teachers leverage emerging technologies, such as Geospatial AI, WebGIS, Virtual Reality, and AI-powered learning platforms, to develop students' spatial reasoning and critical thinking skills while navigating resource constraints. Preliminary findings from our first phase of semi-structured interviews with geography teachers reveal complex tensions between technological aspirations and structural limitations. Teachers demonstrate varying levels of agency in their approach to AI integration, influenced by their digital literacy, perceived institutional support, and personal beliefs about technology's role in geography education. Initial workshop interventions focused on enhancing teachers' AI literacy showed promising shifts in self-efficacy and pedagogical innovation. This poster presentation outlines our methodological approach, presents preliminary findings, and discusses emerging ethical considerations in AI integration for geography education. We highlight how the combination of enhanced teacher agency and targeted institutional support creates pathways for more equitable, engaging, and future-oriented geographical learning in resource-constrained environments. By investigating the relationship between teachers' agentic capabilities and AI integration, this research contributes to ongoing discussions about technological innovation in geographical education and provides actionable insights for educators and policymakers working in similar contexts globally, aligning with the conference's focus on transformative pedagogies that address contemporary geographical challenges.

How School Geography in South Korea textbooks conduct the ESD: Focusing on textbook analysis about "the climate change and sustainable world"

JaYeon **Yang**

This study aims to examine the property of a new subject in upper secondary school geography in South Korea, the Climate Change and Sustainable World, through textbook analysis. In the Korean national curriculum, which will be newly applied from March 2025, based on upper secondary school standards, a new subject, 'Climate Change and the Sustainable World,' was established in geography. The purpose of this subject is for students to become ecological citizens who not only perceive the world differently in an era of climate change and environmental crisis but also pursue values such as consideration, responsibility, inclusion, and recognition necessary to create a world of coexistence with humans and non-human beings, while equipping students with the role and practical capacity. Through the two textbook analyses, we identify two properties. First, the contents of this subject focus on project activities related to the learner's career path with the two major concepts: climate change and sustainability. For example, students explore interviews with various jobs to understand how each job relates to climate change and sustainability. Based on this, activities are presented to help students imagine and investigate the city they want to live in in the future. Second, the subject emphasises activities that encourage students to analyse the knowledge necessary as ecological citizens through data analysis from regional to world scales. For example, activities involve investigating, planning, and practising the commons movement at home and school, as well as inquiries into past and present activities in various ecological cities around the world, along with the transition towns. This demonstrates that the textbook has shifted from an explanation-centred approach to one centred on recent data analysis. These results indicate that it is possible to reconfirm through textbooks what the capacity is to cultivate ecological citizens, which details the purpose of the subject.

Fieldtrips

Hermanus – Monday, 27 October

Join us for an unforgettable field trip exploring the stunning landscapes, unique wildlife, and cutting-edge scientific research of the Western Cape. This full-day excursion combines geomorphology, conservation, and space science, offering delegates a genuinely immersive experience. This field trip is fully booked.

Stellenbosch – Friday, 31 October

Choose **ONE** of the cultural experience options.

OPTION 1: Kayamandi, South Africa

Join us for an authentic cultural experience, connecting with local communities, contributing to their economic growth and development through immersive tourism.

Itinerary:

08:00 Meet at the conference venue.

Depart for Kayamandi

09h00 *Kayamandi on foot*

A 1.5-hour walking tour through the streets of Kayamandi, led by local guides who share personal stories, the community's history, and its daily rhythm. Along the way, you will visit local schools, spaza shops, and bustling hair salons, immersing yourself in the everyday life of this thriving township.

11h00 *Djembe Drumming*

Discover the rhythm central to Xhosa culture in this lively 20-minute drumming session. It will leave a lasting impression.

11h30 *Cultural Meal*

Savour an authentic meal at AmaZink, featuring flame-grilled chicken, boerewors, pap, and the ever-popular chakalaka sauce. Enjoy your meal with a soft drink while soaking up the lively atmosphere of the community.

13h00 Return to conference venue

Cost: R750

There may be a small additional cost for transport to and from the township (TBC).

Limited spots available! Secure your place now by completing the booking form: here

OR

OPTION 2: Stellenbosch Historical Tour, South Africa

09:00 Meet at the conference venue.

Depart for *Stellenbosch on Foot*

Join *Stellenbosch on Foot* for a 1.5-hour historical tour of Stellenbosch and explore the "village of the oaks" with its shady oak avenues bordered by the water furrows of the Mill Stream. Admire the charm and harmony of the Cape Dutch Architecture and listen to tales about the colourful inhabitants of three centuries.

Discover where Simon van der Stel set up camp in the Eerste River and why it is called the Eerste River. Perhaps you will meet an angel at the "Angel Factory" or a ghost in the graveyard of the" Moederkerk".

Three fires destroyed the village. Where did the fire of 1710 start, and who started it? The first Christian Church building in South Africa was in Stellenbosch, not in Cape Town. Today, it is the site of the oldest hotel in South Africa, d'Ouwe Werf, and not all the graves have been moved.

Dorp Street, "the wagon way to Cape Town," is the oldest residential street in South Africa today. It is still the wagon way to Cape Town, only the wagons have changed somewhat!

We invite you to join Stellenbosch on Foot for a Historical tour of Stellenbosch to hear many more interesting facts and fables about the past while experiencing the present in "The Eikestad".

Cost: R220

Booking form: here

OR

OPTION 3: Stellenbosch Art Tour

10:00 Meet at the Conference venue

A 2.5-hour walking tour through the historic streets of Stellenbosch, visiting some of the art galleries and meeting the artists.

Stellenbosch is world-renowned for some of the finest wines South Africa has to offer, as well as the university and the rich history of the town, nestled in the heart of the Cape Winelands.

But in recent times, Stellenbosch has established itself as one of the leading art destinations in South Africa. This is evident by strolling the shady oak avenues, bordered by water furrows, while admiring the Stellenbosch Outdoor Sculpture Trust (SOST) exhibit.

Join us for a not-to-be-forgotten on-foot experience through the streets of Stellenbosch. Your qualified guide will walk with you through the more than 300-year-old streets of Stellenbosch, where you can admire the charm and harmony of the Cape Dutch Architecture. The tour will not only give you the chance to admire some of the best art and art galleries in South Africa, but you will also meet some artists at their studios.

Cost: R340

Booking form: here

OR

OPTION 4: Social Justice Walk

09:00 Meet at the Conference venue

This informative tour combines two aspects of the town's history.

It tells the story of the decline in race relations in the 1940s, the reality of Apartheid laws and the forced removal of 3700 people in Die Vlakte in 1964. The local guides tell stories of the many lives, schools, churches and businesses affected by this historical injustice.

The second aspect is the University's visual redress project, which addresses the much-needed transformation and decolonisation of the campus.

It offers a look at changes and creative additions to the campus, aiming to make the campus a representative, welcoming, and inspiring environment for all South Africans.

Cost: R450

Booking Form: here

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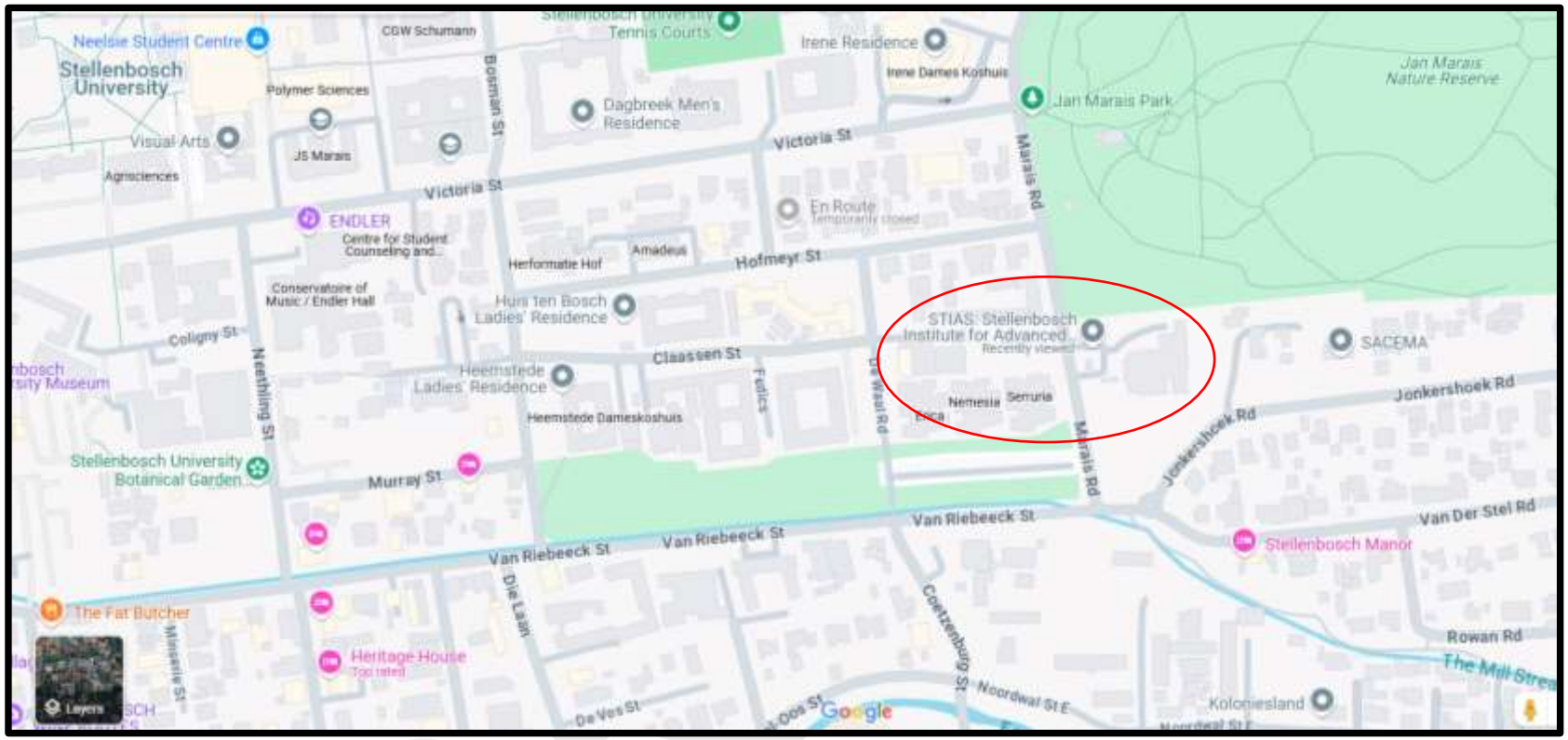

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