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Mathematics Education Research Group

Profiles of some doctoral students of the

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Name	Dimitrios Deslis
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Qualifications	• BA in Primary Education, Aristotle University of Thessaloniki, Greece • MA in Didactics of Science & Mathematics, Aristotle University of Thessaloniki, Greece • MPhil in Educational Research, University of Cambridge, UK
Current course	Full-time PhD programme
Brief bio	From an early age, I realised that I hold Mathematics in great respect and admiration. Thus, unsurprisingly, during my undergraduate studies I developed a strong interest in the field of Mathematics Education. After my graduation, I worked as a primary school teacher and at the same time studied for my first master's degree. The valuable teaching and research experience I gained these years were both extremely stimulating and inspiring, and sparked in me the desire of pursuing further postgraduate studies at Cambridge. Investigating and enriching the ways in which Mathematics is taught and learnt can help the world become a place where the validity of ideas rests on reason. I consider myself fortunate to have the opportunity to contribute to this goal through my research!
Doctoral research topic/project	My PhD research focuses on the investigation of primary school teachers' mathematical knowledge and views relevant to Lakatos-style proof instruction. I am also exploring the affordances of using an online interactive environment featuring animated classroom episodes to offer teachers the opportunity to develop their knowledge and views, and prepare for bringing Lakatos-style activity into their classrooms. In the context of the primary school classroom, this style of proving activity can engage students with the development and refinement of conjectures through the discovery and examination of examples and counterexamples. Its incorporation into the classroom can help promote the place of proof in primary school mathematics, in a way that respects students as learners, teachers as professionals, and mathematics as a discipline.

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Name	Siti Nadiah Binti Mohammad Johari
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Qualifications	• Bachelor of Education (Teaching English as a Second Language) Universiti Kebangsaan Malaysia (Malaysian National University), Malaysia • Master of Education (Teaching English as a Second Language) Sultan Idris Education University, Malaysia
Current course	Full-time PhD programme
Brief bio	I am from Sarawak, Malaysia, and of the Iban descent. I was an English teacher for almost 9 years, teaching in a national school at the outskirts of the Saratok district. Other than being a teacher, I am a gamer which made me interested in integrating video games into the curriculum. During my teaching tenure, I found pupils who do play video games sometimes retell their video game strategies to solve a problem and I wondered if we could harness the benefit of strategical video gaming to help develop problem solving skills. In 2019, I received a scholarship from the Malaysia Ministry of Education to pursue my doctoral studies here in Cambridge.
Doctoral research topic/project	The existence of problems and planning required to achieve a win in strategical games provide a potential platform for players to practice and have real time feedback in using their problem-solving skills. Strategical video games allow players to learn from past mistakes, and redo their plan of action in an engaging environment where the pace of learning caters to the level of the players, as many strategical video games progress from low to high difficulty level. Nadiah attempts to find out whether strategical video games could help develop pupils' problem solving skills and in which area it improves as well as to create a systematic and feasible mechanism to allow schools or teachers to have the option of utilizing strategical video games effectively.

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Name	Darren Macey
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Qualifications	• BSc in Mathematics, University of Leeds, UK • PGCE, University of East Anglia, UK • MEd in Mathematics Education, University of Cambridge, UK
Current course	Part-time PhD programme
Brief bio	I worked as a secondary mathematics teacher for ten years before working on qualifications support and reform in England – supporting the development of new GCSE Maths, A-level Maths, Further Maths, and Core Maths. Over the last five years I've worked at Cambridge Mathematics, developing a research-informed framework for maths curriculum design with statistics education my area of specialism. During this time, I've co-authored a book aimed at supporting stats pedagogy - 'Teaching Statistics' – I'm an ambassador for the Royal Statistics Society, a member of the RSS Teaching Statistics SIG committee and a trustee of the teaching statistics trust. I'm passionate about supporting teachers of statistics and am regularly involved in professional development and outreach in this area.
Doctoral research topic/project	Recommendations for the delivery of statistics education have been relatively consistent for some years but the pipeline for these recommendations into classroom practice is not effective. For my PhD study I will be conducting design research to develop professional development activities that aim to support coherence in teachers' conceptual understanding of statistics and investigate how this then influences teacher agency and decision making in the classroom.

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Name	Lucy Rycroft-Smith
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Qualifications	• First Cert in Art & Design with Philosophy, The University of Reading • BSc (Hons), The Open University (upper second-class; mathematics and linguistics) • PGCE (Mathematics), The Open University (distinction) • Postgraduate Diploma in Professional Studies in Education, The Open University • Master's in Mathematics Education, University of Cambridge (distinction)
Current course	Part-time PhD programme
Brief bio	Lucy is a former teacher of mathematics at primary, secondary and university level. She has worked as head of mathematics at a large comprehensive school in England, consulted in primary schools on transitional mathematics, and given talks and presentations internationally on mathematics education issues. She is an award-winning mathematics resource designer and a freelance writer, writing and speaking on education for the Guardian, the Chartered College of Teaching, the BBC and the Times Educational Supplement and hosting the TES podcast Mathematics. She is the co-editor of Flip the System UK: A Teachers' Manifesto (Routledge, 2017) and writer of The Equal Classroom: Life-Changing Thinking About Gender (Routledge, 2019). She is a Framework Designer at Cambridge Mathematics, with particular responsibility for discrete mathematics, and writer/editor of Espressos.
Doctoral research topic/project	Lucy's research interests are wide and varied, but her doctoral project is focused on communicating education research to teachers. She is interested in examining the landscape of the research-practice gap, with particular eye to both innovation in and evaluation of the different materials available for teachers which summarise or translate research. She is considering these ideas in the context of Foucauldian transgression and poststructuralism, and using both comparative judgement and design-based research (DBR).

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Qualifications	• Bachelor of Science in Mathematics and Applied Mathematics in Education, Shenzhen University, China • Master of Education, Chinese University of Hong Kong, China • Master of Science in Information Technology in Education (Learning Technology Design), University of Hong Kong, China
Current course	Full-time PhD programme
Brief bio	Hi, I am Mei. This is my Chinese name, and it also stands for my passion that has always been: Mathematics Education Innovation. Before studying in Cambridge, I worked as a research assistant for several projects about virtual reality, computational thinking, and proportional reasoning in Hong Kong, and my bachelor thesis was about students' mathematical problem solving. All of my previous experiences have shaped my current interest in studying the pedagogical uses of technology in the teaching and learning of high-order mathematical thinking like mathematical reasoning and proof.
Doctoral research topic/project	In my research, I focus on Lakatos-style proof-related instruction, a specific style of proof-related instruction which can potentially satisfy both teachers' and learners' needs. Specifically, I aim to study teachers' decision-making processes in this style of instruction. It is expected that my research can deepen our understanding of teachers' decision making in Lakatos-style instruction and lay a foundation for the design of a simulated environment in which teachers can learn this style of instruction.

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Name	Sisi Lin
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Qualifications	• Bachelor of Science in Education and Human Science, The University of Nebraska Lincoln, USA • Master of Science in Psychoanalytic Developmental Psychology, University College London, UK
Current course	Full-time PhD programme
Brief bio	I have been interested in child development from both a cognitive and social-emotional perspective. I originally planned to train as a child psychoanalyst until I founded a Chinese school sponsored by University College London after my master's degree. I have since successfully grown it into a healthy business, providing children with Mandarin and mental maths and abacus learning in London. I have always been passionate about studying children's maths ability development. I have accumulated research and real-life teaching experience in Mental Maths in countries such as the UK, US, Italy and China. I have also co-authored a textbook series on mandarin learning for children from 4 years old, published by JiNan University Press.
Doctoral research topic/project	My research focuses on developing young students' early number understanding, such as subitising, counting and unit construction using an abacus (a mathematical manipulative widely used in the Asian context), as well as their motivational orientations towards early number learning tasks. This study is closely aligned with the UK Department for Education's interest in developing students' confidence and mental fluency with whole numbers, counting and subitising, using practical resources for reception-aged pupils. The expected gains will support the development of participating students' understanding of numbers and relationships with numbers, leverage students' conceptual subitising and counting skills, and enhance positive motivation towards number learning tasks.

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Qualifications	• Bachelor of Mathematics Education, Universitas Mataram, Indonesia • Master of Science in Mathematical Analysis, Universitas Gadjah Mada, Indonesia
Current course	Full-time PhD programme
Brief bio	I am from Lombok, Indonesia, and an awardee of the LPDP scholarship. I have always been passionate about helping students learn mathematics. I am particularly interested in the reasoning and argumentation elements of mathematics which brought me to work in the analysis area for my master's degree, and now studying proof for my PhD.
Doctoral research topic/project	My research focuses on undergraduate mathematics students' understanding of proof by contradiction and proof by contraposition. The proof methods that have been identified as the two most challenging proof methods for students. This study will investigate students' understanding and perception of the two proof methods through PREIN Framework. The expected gains will deepen our understanding of how undergraduate mathematics students understand and perceive these proof methods. Hence, a suitable learning intervention could be designed to improve students' competence in these proof methods.

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Qualifications	• Bachelor of Social Science (Honours in Psychology), National University of Singapore, Singapore • Master of Social Work (Social Policy and Evaluation), University of Michigan, Ann Arbor, USA • Master of Education (Curriculum and Teaching), National Institute of Education, Nanyang Technological University, Singapore
Current course	Part-time PhD programme
Brief bio	Prior to starting her PhD at Cambridge, Jo has taught undergraduate and graduate courses in Quantitative and Qualitative research methods, Statistical analysis using SPSS, and Programme evaluation at the Singapore University for Social Sciences (SUSS). She also served as a Capstone Course Coordinator and Research Supervisor for undergraduate dissertations. As a certified trainer, Jo has conducted professional development courses for teachers and worked as a consultant to schools for GCE 'A' Level Project Work and for their Research Education programme. A lover of nature and the outdoors, Jo enjoys hiking and ikebana (Japanese flower arrangement).
Doctoral research topic/project	Jo's doctoral research examines Mathematics teachers' feedback to students' mistakes by analysing their dialogic interactions in the classroom. This is important because a major part of the pedagogical content knowledge needed for teaching mathematics is understanding how to provide quality feedback to students' common misconceptions. This research is significant for its application to guide the development of an Artificial Intelligence (AI)-empowered Learning Feedback Assistant (chatbot) to improve the learning of Mathematics. This can potentially be a cost-effective and scalable solution to provide learning support outside of the classroom, especially for under-performing students from low-income families.

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Qualifications	• Bachelor of Science in Mathematics Education (Integrated BS & MS Program in Mathematics Education), Bogazici University, Turkey • Master of Science in Secondary School Science and Mathematics Education, Bogazici University, Turkey
Current course	Full-time PhD programme
Brief bio	From academic aspects, my research interests lie in the broad field of critical mathematics education (or social justice mathematics), digitalisation in education, teacher education, and philosophical beliefs on the nature of mathematics. I have research assistant experiences as an undergraduate student assistant and a project assistant at Bogazici University. These experiences gave me valuable insight into the research process and academic life. Moreover, my experiences in a student-teacher internship at private and public high schools enabled me to see a huge gap between the quality of education of these schools in terms of teaching methods, technological, and physical facilities. Reflecting on those observations led me to study Critical Mathematics Education in my master's study.
Doctoral research topic/project	Building on my master's thesis and considering literature on Critical Mathematics Education (CME) in teacher education, in my PhD dissertation, I explore novice mathematics teachers', who begin to develop a teaching philosophy and teaching methods while teaching, CME awareness through the way they engage in data science projects implementing the CME perspective. Engaging in those tasks may open a way to reflect on their doing mathematics and action of teaching. In precisely, through the data science projects, reflecting on large-scale socio-political problems reveals their technological, mathematics, political and social forms of knowledge considering actions of learning and teaching, and this explicit reflection and action praxis may lead to CME awareness or even critical mathematical literacy.

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Qualifications	• Bachelor of Philosophy, Wuhan University, China • Master of Arts in Early Years Education, University College London, UK
Current course	Full-time PhD programme
Brief bio	For the past five years, I have been working on developing early years teacher training programs in Chinese disadvantaged areas, in places such as UNICEF, Beijing Normal University's Child Welfare Research Centre, and Anji Early Childhood Education Research Centre. I am particularly interested in exploring children's learning in play from a post-structuralist perspective. This inspired my MA dissertation - exploring Chinese teachers' and parents' perspectives of play in the contexts of China's 3-6 Learning and Development Guidelines and Anji Play. I have also initiated and run a WeChat official account called PeekabooForum since 1 June 2021, aiming to present fluid and diverse empirical studies and real-life stories about children and childhood, which now has over 3,000 followers and over 100,000 readers cumulatively.
Doctoral research topic/project	My doctoral research focuses on exploring discourses about Chinese children's mathematical learning dispositions, when they transition from preschool's Anji Play model to primary school's exam-oriented education system. I will present and analyse the voices and interactions of Chinese children, teachers and parents (especially from the disadvantaged area) related to mathematics learning dispositions at both school and family levels. This research aims to construct a holistic landscape of key stakeholders' discourses of mathematical learning dispositions in the context of Chinese school readiness. Within a post-structuralist paradigm, my research hopes to contribute to the international literature exploring localised play-based mathematical pedagogies (particularly in the context of the Global South).

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Qualifications	• B.Sc (Hons) Mathematics, St. Stephen's College, University of Delhi, India • Bachelor of Education, University of Delhi, India • Master of Arts in Mathematics Education (Distinction; Outstanding Performance in Education prize for 2021), King's College London
Current course	Full-time PhD programme
Brief bio	Mathematics education has always been the core of my professional being – in my earlier work as a practitioner, and now, as a researcher. In my innings as a practitioner, I focused on designing creative solutions for complex, systemic problems in mathematics education in the context of the Global South. I have been a teacher and teacher educator, conceptualised and created India's first AI-driven mathematics learning program (https://mindspark.in/), and designed innovative, game-based (OER) learning modules and related teacher development modules as Adjunct Associate Professor at the Tata Institute of Social Sciences, Mumbai, in collaboration with MIT, Cambridge, Massachusetts. More recently, I turned to academic research with a particular interest in challenging the current deficit-driven viewpoint that dominates mathematics education discourses globally.
Doctoral research topic/project	Testing-driven notions of 'inclusion' that are currently prevalent in mainstream discourses are intrinsically biased against learners who struggle with test achievement. Mathematics classrooms are a primary site of marginalisation of these learners. My current research is envisaged as a critical ethnographic study that will adopt a poststructural approach to interrogate power relations in classroom interactions - between the teacher, priorly low attaining learners and their higher attaining peers – where I will collaborate with teachers to reflexively question existing discourses and develop alternate conceptions and practices of 'inclusion'. While my field work will be in India, I believe it can provide important insights about how to challenge the existing notions and discourses on 'inclusion' and 'ability' in the wider global context.