



EPI-STEM

National Centre for STEM Education



UNIVERSITY OF
LIMERICK
OLLSCOIL LUIMNIGH

School of
Education

EPI-STEM RESEARCH REPORT 2026

EPI-STEM is a research center hosted by the University of Limerick's School of Education, focusing on Up-skilling and Continuing Professional Development (CPD) of STEM teachers in Ireland. It aims to enhance STEM education through research-led initiatives and teacher development.

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Director of EPI•STEM Welcomes Our Research Report 2026

We are delighted to present our EPI•STEM Report for 2026. You will note from the rich variety of research-informed STEM and STEAM based activities that EPI•STEM continues to thrive as the National Centre for STEM Education in the University of Limerick (UL).

We are thrilled to report our recent success in securing the competitive funding bid for the national management of the third version of our flagship programme - the Professional Diploma in Mathematics for Teachers (PDMT). The PDMT is a unique investment by the Irish government in upskilling teacher knowledge in mathematics in Ireland. UL is ideally positioned in this regard through its extensive networks of mathematics educators in the School of Education and mathematicians in the Faculty of Science & Engineering and elsewhere to lead the PDMT V3 with seven Higher Education Institutes. The University of Galway partners UL to advance the professional portfolio for math pedagogy and support students accessing the diploma as Gaeilge.

You will see from our research publications, and continued success in securing competitive research grants, that we continue to lead the way in relation to advancing knowledge in Science, Mathematics, Technology and Engineering (STEM) education and teacher learning. We continue to secure Research & Innovation partnerships with our doctoral students, local schools and local enterprises. Dr Vo Van De was awarded a two-year postdoctoral enterprise fellowship by the Irish Research Council and Eli Lilly Limerick to advance simulations in the science classroom. Together with Dr Peter Childs we are now hosting Chemistry in Action. The EPI•STEM team are currently working with colleagues from the Bernal Institute to plan the annual chemistry teachers CHEM-ED 2026 conference to be held in UL on Saturday, 24th October 2026.

I want to express my thanks to the EHS faculty office for our non-pay budget and the UL Research Office and Samuel Brzyskiewicz for advancing our online repository of resources - EPI•STEM Academy of STEM Teachers - with over 2,000 STEM teachers.

In a fast-globalising world EPI•STEM is well placed to adapt to change and to continue to engage in key collaborations with the Arts and Humanities to foreground ethics and to humanise STEAM education. My research study with the European Commission confirms this desire to reimagine the EC Horizon 2027 programme whereby a new social contract in education and skills aims to secure a more just, fair and sustainable green and digital transition in a future-oriented Europe (see Mooney Simmie, 2025).

Professor Geraldine Mooney Simmie
Professor of STEM Education, UL

PARTNERSHIPS

GLOBAL- NATIONAL- LOCAL

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EPI•STEM, the National Centre for STEM Education, is strengthening its impact through a wide network of partnerships across global, national and local levels. The Centre works closely with national education policymakers, including the Department of Education and Youth, the Teaching Council, and the National Council for Curriculum and Assessment. EPI•STEM has over 40 affiliates at the University of Limerick and collaborates with national and voluntary teacher support organisations and professional bodies such as OIDE, the Limerick Education Support Centre, IMTA, IAMTA, ISTA and the ETA. At a wider level, EPI•STEM engages with major international policy influencers, including the European Commission and the OECD. Locally, the research centre partners with schools, community groups and leading enterprises such as Analog, Boston Scientific, Eli Lilly, ESB, the Hunt Museum and Serosep. The Centre contributes to national initiatives including the STInt Internship Programme with DCU and UL's Citizens' Assembly. These research & innovation collaborations form the backbone of EPI•STEM's mission to advance STEM teacher education across Ireland and beyond.

EPI•STEM LABORATORY (A-1065)

The EPI•STEM Laboratory (Main Building Room A1065) is a cutting-edge, multipurpose academic and outreach space that supports a wide spectrum of Research & Innovation (R&I) activities across the research centre. This includes STEM lectures, PDMT lectures, seminars, conferences, departmental and team meetings, outreach events, STEM workshops, pedagogy workshops, PhD viva's, PME meetings, and second level school workshops and presentations. In addition to scheduled activities, the EPI•STEM Laboratory is used daily for core, routine STEM work, such as teaching preparation, hands on demonstrations, practical materials setup, informal academic consultations, supervision and mentoring of 100s of STEM student teachers, and the ongoing development of research-led STEM pedagogy resources.



Professor Geraldine Mooney Simmie's inaugural lecture to the University of Limerick

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Photograph from left to right:

Professor Paul Conway, Head of the School of Education, Professor Geraldine Mooney Simmie, Professor of STEM Education, Professor Deirdre McGrath, Dean of the Faculty of Education and Health Sciences and Professor Shane Kilcommins, President of the University of Limerick.

Professor Geraldine Mooney Simmie presented her inaugural lecture at the University of Limerick on Monday 15th December 2025. The lecture, by special invitation from Professor Deirdre McGrath, Dean of the Faculty of Education and Health Sciences marked the third year of Geraldine's appointment as Professor of STEM Education in the School of Education and her fifth year as Director of EPI-STEM The National Centre for STEM Education.

The lecture was formally opened by Professor Paul Conway, Head of the School of Education followed by a welcoming address by Professor Shane Kilcommins, President of the University of Limerick. The lecture provided an opportunity for Professor Mooney Simmie to share something of her background and passion as a researcher in the Cultural Politics of STEM Education and her theorisations of STEM teachers' identities and practices.

Professor Mooney Simmie grew up in Lisdoonvarna, County Clare, the seventh of a family of nine siblings. Geraldine thanked her parents, Hilda and Stephen Mooney and expressed a special word of thanks to Sr Rosarii Mc Guane from Corofin, Co. Clare and Tom Tarpey from Ardahan, Co. Galway for instilling a love of science, mathematics, music, culture and politics in Mary Immaculate Secondary School. Geraldine went on to thank the former Minister for Education Donogh O'Malley TD for her opportunity to enter the University of Galway. Geraldine graduated with a degree in chemistry and mathematics and a master's by research in chemistry before completing the higher diploma in education and becoming a science and mathematics teacher in the Jes (Coláiste Iognáid S.J.) in Galway. Geraldine lives in Furbo, Co. Galway with her husband John. Their adult sons live in London.

While dedicated to her role as a science and math teacher in the Jes, Geraldine wrote chemistry textbooks and was a member of the Junior Cycle Chemistry Support Team. This was followed by a decade on secondment supporting Transition Year in the west of Ireland. This experience awakened a deep understanding of what is meant by a holistic education. It is clearly more than the sum of the parts and more than anything that can be counted and measured. Taking a critical feminist perspective, Geraldine's research views STEM education as an open ethical question concerned as much with the heart and soul project of human becoming as much as with the relational journey involved in becoming a worker or citizen.

This experience set the scene for Geraldine's entry into higher education, and her PhD study in Comparative Policy Education between Ireland and Norway, in relation to science and mathematics teachers' learning with Dr Seamas Ó'Buachalla, in Trinity College Dublin. During the last twenty years in UL, Professor Mooney Simmie has produced an impressive collection of substantive academic papers in top journals, arising from her research work with colleagues in EPI-STEM and with international research colleagues.

At her inaugural lecture, Professor Geraldine Mooney Simmie thanked her colleagues in the School of Education and across campus in addition to the intellectual environment in EPI-STEM The National Centre for STEM Education to engage in cutting-edge research as a policy researcher in STEM education. As Director of EPI-STEM, Geraldine leads the research work of PhD students and postdoctoral research fellows and is supported in this work by over forty EPI-STEM affiliates, including student teachers, scientists, mathematicians and engineers in UL, and the wider community of schools, teachers, education centres and local enterprises. In addition to the core EPI-STEM team, the centre is supported by former Directors, Professor John O'Donohue, UL, Professor Sibel Erduran, University of Oxford and Professor Marilyn Goos, Sunshine Coast University, Australia.

Today, Professor Mooney Simmie acts as an expert researcher with the European Commission in relation to their new scoping study for Education & Skills for a future green and digital transition in Europe and is the national convenor for the Critical and Feminist Special Interest Group in Ireland with the Educational Studies Association of Ireland (ESAI).

EPI•STEM Postdoctoral Research Award

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EPI•STEM's Postdoctoral Researcher, Dr. Vo Van DE, awarded Research Ireland Enterprise Fellowship for Innovative STEAM Sustainability Education Project



EPI•STEM was awarded a Postdoctoral Fellowship from the prestigious Research Ireland Enterprise Fellowship Award alongside Eli Lilly in Limerick. The postdoctoral fellow Dr Vo Van De will work with Professor Geraldine Mooney Simmie (mentor) and a dedicated research team in EPI•STEM, including Dr Michelle Starr to design, develop and trial digital simulations for the science classroom. Our plan is to lead out an research-informed and innovative STEAM education project aligned to the national science curriculum as a school-university-enterprise partnership.

This STEAM education project is a partnership between EPI•STEM, Eli Lilly Limerick and second level schools, with the aim of improving young people's competencies in navigating the complex sustainability challenges facing contemporary society. The complex issues facing the world today do not lend themselves to simple or universally accepted solutions. Instead, critical engagement is necessary for ethical decision making and guiding actions that support care-based, just, and sustainable outcomes.

In line with both national and European policy priorities, and the UN Sustainable Development Goals (SDGs), sustainability education is becoming deeply embedded within the national curriculum. Students are nowadays expected to have competences to analyse scientific evidence, critically reflect on ethical and societal dimensions, and make well informed decisions. This places new demands on schools tasked with making these complex themes accessible, engaging, and empowering for all learners.

This school-university-enterprise partnership takes an integrated STEAM approach on the understanding that creativity, ethical inquiry, and cultural historical awareness are all necessary to engaging with STEM subjects and to grappling with the complex sustainability questions they raise. The Arts provide that critical and humanising lens that enables learners to critically interrogate ethics and societal implications.

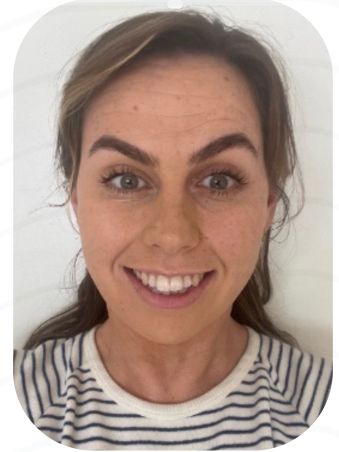
STEAM education practices therefore can foster imagination, perspective taking, and innovation, offering students alternative ways of thinking about and expressing scientific understandings in forms that are both meaningful and personally resonant. This Postdoctoral Enterprise Partner Fellowship will create cutting edge digital resources that support teachers' learning and engage students in real world challenges and sustainability issues. All developed digital resources will be freely accessible to teachers nationwide via the EPI•STEM ACADEMY OF STEM TEACHERS (<https://epistem.ie/resources/>).

Martha Cosgrove

PhD in Science Education

Biography

Martha Cosgrave graduated from the University of Limerick in 2023 with a Bachelor of Science (Education) in Biology and Chemistry. She is currently undertaking a PhD under the supervision of Professor Geraldine Mooney Simmie at the University of Limerick. Martha's research explores senior cycle curriculum reform, with a particular focus on its implications for teacher wellbeing, professional identity, and school culture. Through this work, Martha aims to contribute to informed policy development and support sustainable, meaningful change in post-primary education contexts.



Adrian O'Hanlon

PhD in Mathematics Education

Biography

Adrian graduated from the University of Limerick in 2007 with a Bachelor of Business Studies, followed by Postgraduate Professional Diplomas in Business Education (2013) and Mathematics Education (2015), a Masters in Education Research (2023), and a Masters in Guidance Counselling Lifespan Development (2025). Adrian has recently commenced a PhD under the supervision of Dr Olivia Fitzmaurice and Dr Maria Ryan with research is focusing on the impact of mathematics anxiety on learners with dyscalculia in the FET sector.



David Godley

PhD in Mathematics Education

Biography

I graduated from the University of Limerick in 2023 with a Bachelors of Science in Physical Education with concurrent Teacher Education in mathematics. I am currently completing a PhD under the supervision of Dr Niamh O'Meara. My research is focused on evaluating curriculum and curriculum reform in second level mathematics.



Samantha Prior

PhD in Science Education

Biography

Samantha Prior is currently undertaking postgraduate research in the area of Leading Change in Times of Reform, with a particular focus on a critical examination of school leadership during Ireland's Senior Cycle Redevelopment in science education. Her research explores how school leaders navigate reform, support teachers, and implement sustainable change within evolving educational landscapes.

She holds an undergraduate degree in Science Education, specialising in Biology and Chemistry, and a Master of Science. Her Master's research, titled 'Development of an Intervention Programme to Increase Students' Interest in Science in DEIS Schools', focused on designing and evaluating strategies to enhance student engagement and participation in science, particularly in disadvantaged contexts. This work highlights her strong commitment to inclusive education and improving outcomes for all learners.

Samantha's work sits at the intersection of leadership, policy, and classroom practice. She is particularly interested in how meaningful reform can be enacted in schools in ways that support both teachers and students, ensuring equitable access to high quality science education.



Caroline Sheils

PhD in Mathematics Education

Biography

Caroline Sheils is an experienced post-primary Mathematics and Geography teacher and teacher educator, with over twenty-five years in education. Her research interests include numeracy, curriculum reform, global citizenship education, interdisciplinary curriculum design, and teacher learning across the professional lifespan. She brings extensive experience in national-level leadership, supporting schools and teachers in mathematics education. In recognition of her significant impact on teacher education and student learning, Caroline was awarded a Teaching Hero Award in 2021.

Title of PhD: Strengthening the Transition from Primary to Post-Primary Mathematics: Building Continuity, Student Agency, and 21st-Century Mathematical Competence



Anthony Sweeney,

PhD in Science Education

Biography

Anthony Sweeney is a graduate of the University of Limerick, with over 14 years' experience teaching Science at post-primary level. Currently, Anthony is completing doctoral research under the supervision of Professor Geraldine Mooney Simmie, Assistant Professor Patrick J. Dundon and Dr Michelle Starr in EPI*STEM The National Centre for STEM Education in UL, a study entitled 'A Critical Interpretation of Policies and Teachers' Perspectives in relation to a Relational Ethic of Care in Productive and Multispecies (Canine) Pedagogies in Science Education in Ireland'.

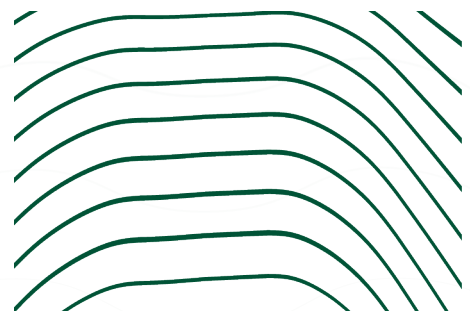
Anthony's research investigates how care-based educational policies are framed in policy and interpreted and enacted within science teachers' reported practices, examining science teaching as relational care work that attends not only to the acquisition of content knowledge but to students' wellbeing, inclusion, and capacity to care for self, others (human and non-human), and ecological futures. Drawing from the theoretical work of the environmental scientist Donna Haraway, Anthony positions School Support Dogs as 'pedagogical partners', reimagining education as cultivating humans-in-relation rather than leading out (educio) competitive, achievement-oriented individuals.



Calie, The School Support Dog

Calie has worked as a School Support Dog since 2018 at post-primary level, contributing to wellbeing, inclusion, and relational care for all students. Callie helps build connections, relationships, and a sense of belonging within the school community.

Calie joined EPI*STEM in 2024 as the Centre's Wellbeing Dog, contributing to Anthony Sweeney's doctoral research on multispecies (canine) pedagogies. Her unconditional and empathetic positive regard promotes students' social-emotional and intellectual development through interdependent affectivity, contributing to growing research on support dogs in general education, and in STEM education and offering new insights into relational pedagogies and care-based learning environments that foster students' capacity to care for self, others (human and non-human), and ecological futures.



Professional Diploma in Mathematics for Teaching (PDMT) Version 3

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The Department of Education and Youth recently indicated that the University of Limerick's competitive funding bid for national management of the Professional Diploma in Mathematics for Teaching (Version 3) [PDMT (V3)] has been successful. The Professional Diploma in Mathematics for Teaching (PDMT) is a flagship programme of EPI-STEM, The National Centre for STEM Education, School of Education, University of Limerick since 2012. It is nationally managed on a day-to-day basis by an EPI-STEM Course Board of mathematics educators, mathematicians and a dedicated team of executive administrators, working closely with the School of Education in UL and running across seven Higher Education Institutes (HEIs), with a unique partnership in relation to math pedagogy and provision as Gaeilge provided by the University of Galway.

The PDMT was originally developed in response to a national need to upskill teachers for post-primary mathematics teaching identified in a report by Ní Riordáin and Hannigan (2010). PDMT (Version 3) will build on the successful PDMT (Versions 1 and 2) designed and delivered by a UL-led national consortium.

The outcome of the latest competitive funding bid, and the decision by the Department of Education and Youth to continue with UL as the lead on this national programme is an excellent outcome and one which reflects the strength of the collaborative approach, the quality of the programme, and the commitment and expertise of all involved with the PDMT to this point.

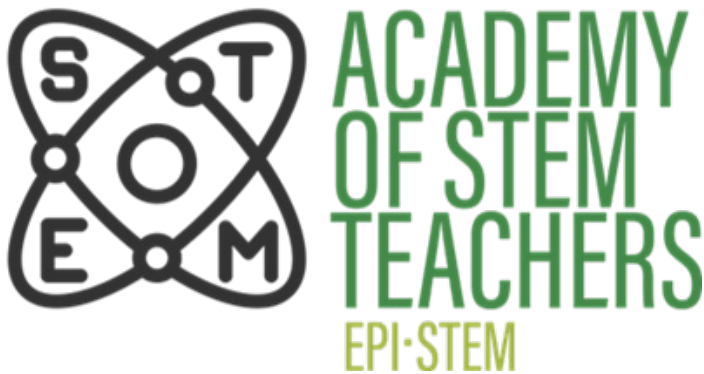
Version 3 of the PDMT is due to commence in September 2026 and the PDMT team in EPI-STEM, led by the Course Director, Associate Professor Niamh O'Meara, a mathematics education lecturer in the School of Education and Deputy Director of EPI-STEM, have already started the recruitment process.

We look forward to applications opening soon and to continue the success of this programme, from which 1,400 students have graduated as fully qualified teachers of mathematics in Ireland to date.



EPI•STEM Launches National Online Academy of STEM Teachers

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A new national initiative aimed at strengthening STEM education in Irish post-primary schools was launched by EPI•STEM at the University of Limerick. The EPI•STEM Academy of STEM Teachers is now inviting science, mathematics, technology, and engineering teachers from across Ireland to join its free online community.



The Academy of STEM Teachers led by Samuel Brzyskiewicz currently offers over two thousand STEM teachers access to a growing bank of research-informed, freely available CPD resources designed to support innovative pedagogical approaches to teaching STEM, integrated STEM, and STEAM. The materials are suitable for Junior Cycle, Senior Cycle, and Transition Year classrooms. For more information contact Michelle.Starr@ul.ie.

The CPD suite builds on methodologies developed through the Professional Diploma in Mathematics for Teaching (PDMT V1) and incorporates contributions from a specialist research design team of STEM teacher educators and practicing teachers. The resource development was funded by the Higher Education Authority (2020–2022). The Academy of STEM Teachers is today funded by the UL Research Office with the appointment of Samuel Brzyskiewicz as a Research Assistant.

All materials have been structured for easy classroom adaptation and include narrated slides, curated website links, and strategies intended to promote deep understanding and inclusive pedagogies. Science teachers can download a newly released Ecology booklet, which compiles podcasts, slide decks, and resource links suitable for classroom use. Four additional science-themed CPD booklets are also available within the Science Education section of the Academy's platform. A new STEAM education resource for Sustainable Education is available.

Teachers interested in accessing these materials or participating in future CPD events at the University of Limerick are encouraged to register online to join the EPI•STEM Academy of STEM Teachers.

New STEM CPD Resources Released on EPI-STEM Academy of STEM Teachers Platform

We have added a number of new resources for Engineering teachers (see John Morris and Liam Maquet), new science resources (Dr Regina Kelly) and three new Mathematics resources in CALCULUS to our online platform the EPI-STEM ACADEMY OF STEM TEACHERS (see link below).

These CPD resources for math teachers of senior cycle were created by Dr Jason Curran (EPI-STEM & Dept. Maths & Stats, UL) are available under the Mathematics Education category and within the Calculus CPD Presentations and Supplementary CPD resources folders and include the files stated below.

- CPD #7 Differential Calculus
- CPD #8 Functions in Calculus
- CPD #9 Integral Calculus

Supplements

- Application of Differentiation (MaxMin Problems)
- Average Value
- Chain Rule

The additions reflect EPI-STEM's ongoing commitment to providing accessible, high-quality, research-led professional development to mathematics teachers nationwide.

Further details and access to all CPD materials are available through the EPI-STEM Academy of STEM Teachers online portal <https://epistem.ie/resources/>

We encourage you to explore these new materials and adapt them to support your practice. As always, we welcome any feedback you may have.

For further information e-mail:
michelle.starr@ul.ie
or
epistem@ul.ie

EPI•STEM Welcomed Dr David King from the NCCA

EPI•STEM hosted a seminar with David King from the National Council for Curriculum and Assessment (NCCA) to discuss the newly introduced senior cycle specification, Climate Action and Sustainable Development. The seminar was well attended with broad interfaculty interest and took place on Monday, September 29, 2025, in the EPI•STEM Lab A1065. Dr David King outlined the work of the NCCA Development Group in shaping the curriculum specification and shared insights into the design process. David provided useful links to the specification and details of the development process undertaken by the NCCA. In addition to discussing Climate Action and Sustainable Development, Dr King briefly addressed developments in Senior Cycle Biology.

EPI•STEM Networking Seminar on Publishing STEM Education Practices

A networking seminar on publishing your STEM Education Practices, was held in the EPI•STEM Lab A1065 on May 16th from 1pm to 3pm, led by Dr. Jason Power and Dr. David Tanner. The research seminar focused on the benefits of researching and publishing educational practice within STEM disciplines. During the seminar, participants explored a variety of approaches for evaluating and publishing their philosophy and practices of teaching. Attendees networked with potential collaborators from both international institutions and across different faculties.

EPI•STEM Research Seminar with Austrian Delegation

EPI•STEM in collaboration with the Centre for Transformative Learning, hosted an International Research and Networking Seminar on Monday, 26 May 2025. The seminar took place in the EPI•STEM Lab A1065 and welcomed faculty and staff from the Pädagogische Hochschule Vorarlberg, Austria (University College of Initial Teacher Education). The visiting delegation included Professor Sandra Bellet, Head of the International Office, along with Claudia Zeppetzauer from Linguistic Pedagogy; Professor Thomas Schroffenegger, representing STEM areas including Mathematics, Digital Education, and Media Pedagogy; and Professor Catriona Shaw from Art & Design Education. Attendees had the opportunity to engage in cross institutional discussion and learn about international perspectives on STEM and teacher education.

EPI•STEM Mathematics Education Research Seminar on Out-of-Field Teaching



EPI•STEM welcomed Professor Merrillyn Goos to UL as the keynote speaker for a research seminar focused on contemporary challenges in mathematics teacher professional education. This keynote took place in the EPI•STEM Lab (Room A1065, Main Building) on Tuesday, 11 November 2025, and brought together researchers, educators, and national policy partners to engage with emerging international research on the changing landscape of the teaching workforce.

Professor Goos, a leading mathematics educator and researcher, shared insights drawn from her extensive experience in universities across Australia, the United Kingdom, and Ireland. Her presentation, “Shifting the culture of professional education for out of field teachers,” was based on early findings from a current Australian Research Council-funded research project. The seminar addressed the growing teacher shortages experienced in Australia and internationally in the aftermath of the COVID 19 pandemic. Professor Goos highlighted how these shortages had led to an increasing reliance on out of field (OOF) teaching. She outlined how the lack of systematic data on teacher subject specialisation had contributed to the normalisation of out of field teaching as a long term solution, despite its implications for teacher expertise and student learning. While professional education opportunities such as graduate certificates and micro credentials were available, Professor Goos emphasised that their impact was often limited by cultural norms within schools and education systems that failed to adequately recognise or value subject specialisation.

The presentation explored how these cultural responses were shaped by data collection practices, teacher registration policies, and school structures, and how such systems influenced teachers’ engagement with professional education. Early findings from the project examined factors affecting uptake of professional education by out of field teachers, including school priorities, policy contexts, stakeholder roles, and system level incentives. The seminar closed with discussion of the project’s overarching goal: to develop an education ecology model capable of fostering a cultural shift that values re specialisation through professional education, while addressing the complex challenges associated with systemic reform.



EPI•STEM Lectures and Seminars



EPI•STEM Research Seminar Exploring Pedagogical Frameworks in STEM Education



EPI•STEM's research seminar on Wednesday, 11 June 2025, from 1pm to 2pm in the EPI•STEM Lab A1065 explored emerging pedagogical frameworks for STEM teacher education and professional development. The research seminar, entitled "Exploring the concepts of signature, nomadic and future pedagogies: frameworks for teacher education and development in STEM," was presented by Dr Matt McLain of Liverpool John Moores University (LJMU).

Dr McLain explored three evolving pedagogical frameworks—signature, nomadic, and future pedagogies—as lenses for rethinking STEM teacher education and professional development. The concept of future pedagogies encouraged speculative and forward looking approaches to education, supporting engagement with complexity, uncertainty, sustainability, and creative design practices.

Dr McLain is an academic and researcher at Liverpool John Moores University (LJMU), specialising in teacher education and development, with a particular focus on design and technology (D&T) education. With over thirty years of experience in education—including twelve years teaching in secondary schools and fifteen years in teacher education—his work reflects a strong commitment to research informed practice, social inclusion, collaboration, and educational leadership.

The seminar formed part of EPI•STEM's ongoing programme of research-informed events and contributed to wider discussions on innovative pedagogical approaches in STEM education and teacher development.



The Shifting Landscape of Higher Level Senior Cycle Mathematics



While the last 14 years has seen a 129.7% increase in the proportion of students opting to complete Senior Cycle Mathematics at Higher Level, this marked surge since the Bonus Points Initiative (BPI) was introduced in 2012 has had some unintended consequences. The report outlined how the introduction of bonus points has led to a reduction in mathematical standards and a slowing of the pace of learning in classes, with many students who struggle with mathematics pursuing the higher level course, often to their own detriment and the detriment of other students.

Furthermore, the report finds that standards linked to grades awarded upon completion of Senior Cycle Higher Level Mathematics appear to have declined in the past 15 years. At the launch event, the authors, Dr Páraic Treacy, Dr Mark Prendergast and Dr Niamh O'Meara commented: "This report is the culmination of six years of research examining the impact of bonus points on Senior Cycle mathematics students and teachers, as well as the wider implications for the education system in Ireland. It is a complex issue which has led to some very interesting findings beyond the surface level effect bonus points has had on participation in Higher Level Senior Cycle mathematics.

This report gives us a clearer picture of the totality of the impact of bonus points and outlines evidence-informed action which should be taken in light of these findings."

The report is available here to download at :
<https://epistem.ie/research/>

SELECT PUBLICATIONS EPI-STEM RESEARCHERS & AFFILIATES (2025-2026)

ISI Journal articles:

Azevedo, N. H., et al. (2026). From scientific literacy to citizenship. *Journal of Outdoor and Environmental Education*. <https://doi.org/10.1007/s42322-025-00238-z>

Azevedo, N. H., et al. (2025). Redefining learning spaces. *Journal of Adventure Education and Outdoor Learning*. <https://doi.org/10.1080/14729679.2025.2542841>

Blom, N. (2026). Leadership development as a missed opportunity. *International Journal of Technology and Design Education*. <https://doi.org/10.1007/s10798-026-10067-w>

Blom, N., & Mifsud, D. (2026). A scoping review of followership literature. *Leadership and Policy in Schools*. <https://doi.org/10.1080/15700763.2025.2608046>

Blom, N., O'Connor, S., Lane, D., et al. (2026). Beyond procedural approaches to designing: A framework for supporting students' hierarchical thinking through their representational journeys. *International Journal of Technology and Design Education*, 36, 153–177. <https://doi.org/10.1007/s10798-025-09990-1>

Curran, J., Walsh, R., & Guerin, A. (2026). Identifying transient and persistent issues relating to the secondary–tertiary transition and the coping mechanisms of engineering mathematics students. *Teaching Mathematics and Its Applications*. <https://doi.org/10.1093/teamat/hrag007>

Curran, J., Walsh, R., & Guerin, A. (2025). Factors affecting undergraduate engineering students' perception of mathematics modules. *MSOR Connections*, 23(3), 24–35. <https://doi.org/10.21100/msor.v23i3.1591>

De, Van Vo, Thanh Huynh, V., Samuel, G., & Mooney Simmie, G. (2026). Exploring complex problem-solving in Vietnamese students: An investigation of performance data and process data. *Thinking Skills and Creativity*, 1-18. <https://doi.org/10.1016/j.tsc.2026.102138>

De, Van Vo & Mooney Simmie, G. (2025). Assessing Scientific Inquiry: A Systematic Literature Research of Tasks, Tools and Techniques. *International Journal of Science and Mathematics Education*. <https://link.springer.com/article/10.1007/s10763-024-10498-8>

De, Van Vo et al. (2026). Cyberbullying and digital literacy. *Social Psychology of Education*, 29(1). <https://doi.org/10.1007/s11218-026-10174-5>

Giffney, S., & Lane, D. (2025). Towards an integrated model of STEM education in secondary schools: Perspectives of practicing teachers in Ireland. *International Journal of Technology and Design Education*, 35, 1805–1824. <https://doi.org/10.1007/s10798-025-09971-4>

Leahy, K., Calderón, A., O'Meara, N., et al. (2025). Communities of practice and teacher educator professional learning. *Teaching and Teacher Education*. <https://doi.org/10.1016/j.tate.2025.104925>

Lynch, R., Hennessy, J., & Goos, M. (2026). Role of fictions within teacher education. *Teachers and Teaching*. <https://doi.org/10.1080/13540602.2026.2642676>

Lynch, R., McCormack, O., & Hennessy, J. (2025). Field trips in education. *Journal of Adventure Education and Outdoor Learning*. <https://doi.org/10.1080/14729679.2025.2530091>

Lynch, R., & Hennessy, J. (2025). Classroom management and free will. *Educational Philosophy and Theory*. <https://doi.org/10.1080/00131857.2025.2527228>

McNea, M., Tanner, D., Lane, D., & Cole, R. (2025). A focused look at spatial assessment in technology & engineering education. *European Journal of Engineering Education*, 1–24. <https://doi.org/10.1080/03043797.2025.2572027>

Mooney Simmie, G., & Sheehan, C. (2026). The positioning of moral leadership in primary education: perspectives and contextual understandings of school principals in Ireland. *International Journal of Leadership in Education*, 29:1, 22-38. <https://doi.org/10.1080/13603124.2022.2077457>

Mooney Simmie, G., & Moles, J. (2025). A productive pedagogy of liminality: a counterpoint to a limited performativity. *Pedagogy, Culture & Society*, 33(5), 1769-1786. <https://doi.org/10.1080/14681366.2024.241987>

Mooney Simmie, G., & Tolbert, S. (2025). Science Education for Democracy and Sustainability A Transnational Critique of Policy Texts in a Fast-Globalizing Reform Ensemble. *Democracy & Education*, 1-11. <https://democracyeducationjournal.org/home/vol33/iss2/4/>

O'Connell, T., Kelly, R., & Goos, M. (2026). Cultivating STEM futures: An evaluation of the WiSTEM²D program's impact on female STEM students. *Issues in Educational Research*, 36(1), xxx-xxx. <http://www.iier.org.au/iier36/oconnell.pdf>

O'Connor, S., Power, J., Blom, N., & Tanner, D. (2025). Engineering students' perceptions of PBL. *Australasian Journal of Engineering Education*, 30(2), 138–162. <https://doi.org/10.1080/22054952.2025.2493419>

O'Meara, N., & Fitzmaurice, O. (2025). Out-of-field mathematics teachers' confidence and understanding of rational numbers. *Journal of Mathematics Teacher Education*, 1–34. <https://doi.org/10.1007/s10857-025-09732-z>

O'Meara, N., Jennings, M., Prendergast, M., & Treacy, P. (2025). Incentivising the study of advanced mathematics. *Issues in Educational Research*, 35(3), 1054–1077. <https://hdl.handle.net/10344/31356>

O'Meara, N., Prendergast, M., & Duffy, L. L. (2025). Teachers' perspectives on private mathematics tuition. *International Journal of Mathematical Education in Science and Technology*.
<https://doi.org/10.1080/0020739X.2025.2502391>

Power, J. R., Tanner, D., & Buckley, J. (2025). Self-efficacy development in undergraduate engineering education. *European Journal of Engineering Education*.
<https://doi.org/10.1080/03043797.2024.2368149>

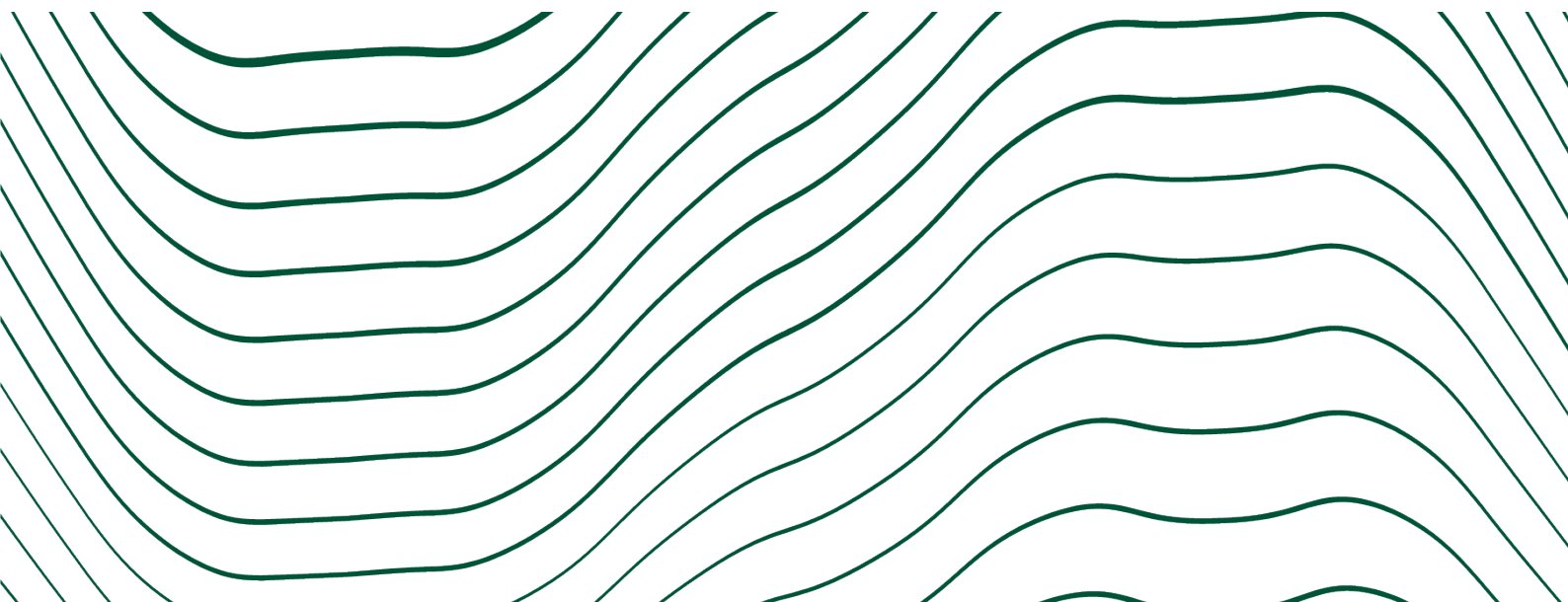
Power, J.R., Tanner, D., Egan, V., Mooney Simmie, G., & Buckley, J. (2025). Engineering self-efficacy development in undergraduates: evolving sources. *European Journal of Engineering Education*. <https://doi.org/10.1080/03043797.2025.2468350>

Power, J. R., Lynch, R., & Atit, K. (2026). Self-efficacy development in student teachers. *European Journal of Teacher Education*.
<https://doi.org/10.1080/02619768.2023.2288555>

Prendergast, M., Forster, A., O'Meara, N., et al. (2025). Numeracy-Meets professional development model. *Irish Educational Studies*, 44(1), 1-21.
<https://doi.org/10.1080/03323315.2023.2209854>

O'Sullivan, K., O'Meara, N., Goos, M., & Conway, P. (2025). The "N" framework for numeracy across the curriculum. *Numeracy*, 18(2).
<https://doi.org/10.5038/1936-4660.18.2.148>

Walsh, R., & Guerin, A. (2025). Student approaches to in-person and online engagement with mathematics learning support post-COVID-19. *Teaching Mathematics and Its Applications*.
<https://doi.org/10.1093/teamat/hraf011>



SELECT PUBLICATIONS EPI-STEM RESEARCHERS & AFFILIATES (2025-2026)

20

Published Research Proceedings & Research Reports

Conway, P., Leavy, A., Smyth, E., et al. (2025). Teachers' professional journeys during the first decade. Limerick: University of Limerick.

Treacy, P., Prendergast, M., & O'Meara, N. (2025). Bonus Territory. Limerick: EPI-STEM The National Centre for STEM Education, University of Limerick.

Maquet, L., Dunbar, R., & Buckley, J. (2025). Decoding design thinking. PATT 42 Proceedings.

Mooney Simmie, G. (2025). How Education and Skills can contribute to an Equitable and Sustainable Green and Digital Transition in Futures Thinking and Acting in Europe. In Education and skills for Social Transformations and Resilience A Scoping Study. Mikolaj

Herbst and Geraldine Mooney Simmie, May 2025, 30-55. Brussels: European Commission

https://employment-social-affairs.ec.europa.eu/education-and-skills-social-transformations-and-resilience_en

Mooney Simmie, G. (2025). Reimagining Science and STEAM Literacies in the Anthropocene: a post-colonial science classroom experience. In Naughton, Y., O'Neill, N., Twohill, A., & Gammell, S. Proceedings of the CASTeL 10th STEM Education Research Conference, SMEC 2025 Beyond Boundaries – Future Proofing Science, Maths, Technology & Engineering Education. Dublin City University, pp. 54-60. <https://doi.org/10.5281/zenodo.17227007>

RTE Brainstorm Articles – J. Power

Power, J. (2026). EU U-turn on petrol and diesel cars. RTÉ Brainstorm.

Power, J. (2025). Electricity grid interconnectors explained. RTÉ Brainstorm.



Erasmus+ GENERA COPA to Embed Gender and Diversity in STEM

The University of Limerick is proud to support the launch of GENERACOPA, a new Erasmus+ initiative to embed gender and diversity across math intensive STEM education and research. At UL, the project is led by Dr. Deirdre Ní Eidhin, Senior Technical Officer in the Department of Physics (PI), working alongside Dr. Regina Kelly, Associate Professor in Science Education in the School of Education and an EPI-STEM Associate. With the main aim to address the critical challenge of attracting and retaining minoritised groups in science and research, the GENERA COPA project has been selected as one of only 25 projects funded out of 124 proposals in the latest Erasmus+ call, receiving €400,000 to implement innovative activities that promote gender and diversity in math-intensive STEM fields.

GENERA-COPA arose from collaboration within the GENERA Network and was officially launched during the General Assembly of this network held in the beginning of September 2025 at UL (event details). The project seeks to transform higher education curricula and institutional culture by integrating gender and diversity perspectives. By building university and research capacity and training local "critical friends" as trainers across Europe, the project ensures the sustainability of its initiatives and long-term transformation of educational practices. With this funding, GENERA COPA is poised to make a significant contribution to the European STEM landscape, promoting equality, diversity, and inclusion across higher education institutions. The project targets internal audiences, including partners, staff, and associated collaborators.

The primary external audience includes higher education teachers, early-stage STEM researchers, mentors and mentees, diversity and inclusion officers, and math field intensive departments and institutions. Secondary audiences comprise policymakers, science communication organizations, advocacy groups for women and minoritized groups in STEM, and the general public interested in equality and STEM. The project involves multiple European universities and research institutions collaborating for 3 years to create a more inclusive and equitable learning environment; it is coordinated by the German research centre DESY, further partner organisations are the Italian National Institute for Astrophysics (INAF), the Italian National Institute for Nuclear Physics (INFN), Weizmann Institute of Science (Israel), University of Limerick (Ireland), University of L'Aquila (Italy), Vilnius University (Lithuania), University of Novi Sad (Serbia), University of Alcalá and University of Oviedo (both Spain), Lund University (Sweden), and the Swiss Physical Society. For more information: Website: <https://www.genera-copa.eu>



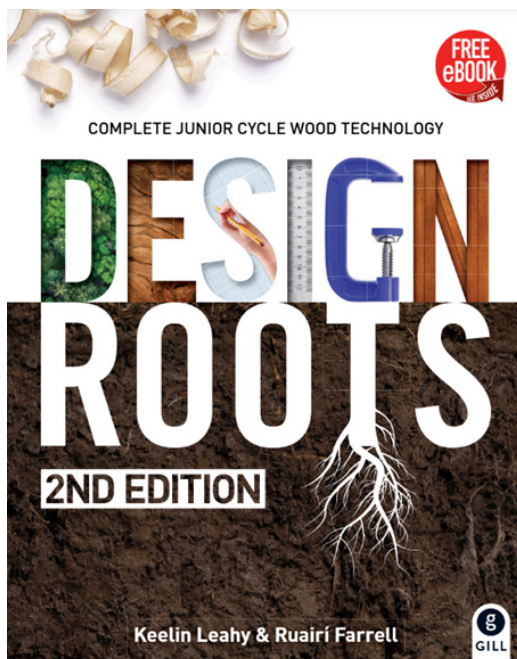
Design Roots 2nd edition – Junior Cycle Wood Technology

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The Junior Cycle Wood Technology specification was introduced into schools in September 2019 as part of the Phase 5 roll-out of the Framework for Junior Cycle (JC). The new Wood Technology specification offered an exciting opportunity for an integrated approach to teaching and learning. Students were now invited to engage in active learning to explore interconnected strands that blend theoretical knowledge with design-based skills. These strands – 1. Principles and Practices; 2. Design Thinking; and 3: Wood Science and Materials – were linked to four elements of Planning and Managing, Communicating, Creating, and Environment and Sustainability.

The Design Roots resource package, designed by Associate Professor Keelin Leahy, a lecturer in wood technology at the School of Education an EPI-STEM Affiliate, with Ruairi Farrell an experienced wood technology teacher and member of the JCT technology advisory group became the only Junior Cycle Wood Technology resource to offer an integrated approach to the three strands and the four elements.

Design Roots includes a 30-chapter textbook, a Project & Activity book, Teacher Planning Guide, and online fun facts and video resources including self-assessment checklists, quizzes, posters, and PowerPoints. Design Roots provides students and teacher with a choice of 17 creative, scaffolded, problem-based projects that enact the JC transferable skills including Managing Myself, Staying Well, Communicating, Being Creative, Working with Others, Managing Information and Thinking, Being Literate, and



Fun Fact

At age 15, an American named Chester Greenwood was motivated to solve the problem of his ears getting cold when he was skating on the frozen ponds in his area. He invented earmuffs! He asked his granny to sew pads of beaver fur onto a wire headband with two hoops on the ends. The design was a success and Chester went on to sell hundreds of thousands of 'Greenwood's Champion Ear Protectors' every year.



Why solve a problem in Wood Technology?

We solve problems to reduce or overcome everyday challenges or issues.

Solve problems for the user

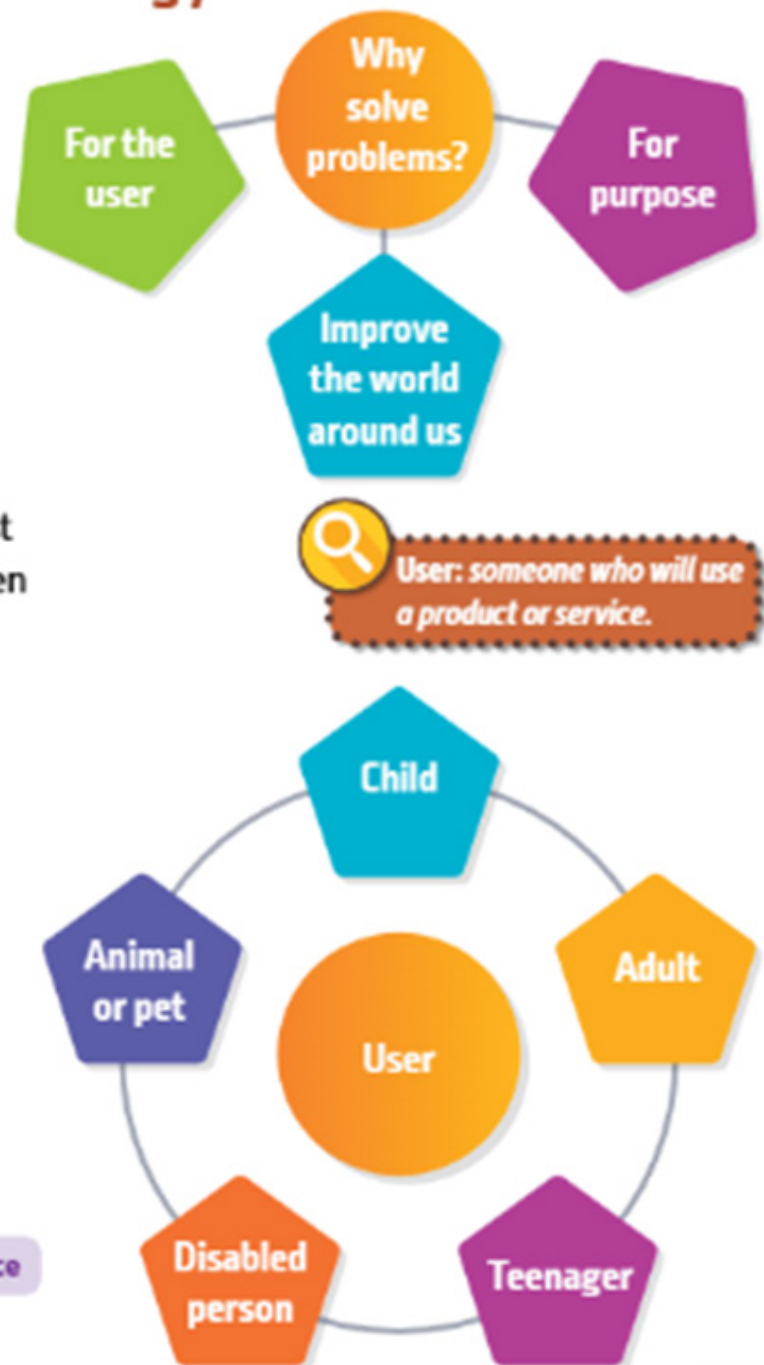
Most of the things we design and make address a need and as a result are used by people or animals. Designers need to understand the world from other people's points of view. Designers 'walk in someone else's shoes'.

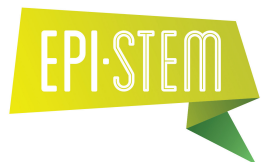
The designer and manufacturer of a product must ensure that the user/consumer is not injured when using a product. The final product:

- Must not be dangerous
- Must not cause damage to the user
- Must not damage the environment.



 Some slime products have unsafe levels of boron. In excessive levels, this chemical can lead to diarrhoea and vomiting





National Centre for STEM Education

Numeracy in Practice: Embedding Numeracy across Adult Education

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Numeracy in Practice: Embedding Numeracy across Adult Education is a national project that aims to support adult tutors in embedding meaningful and relevant numeracy across adult education modules. The project positions numeracy as a practical life skill that is inherent in everything we do. The project will be designed and delivered by a consortium of mathematics teacher educators in the University of Limerick, University of Galway and University College Cork. It received funding under the Adult Literacy for Life Collaborative and Innovation fund in March 2026. The UL lead is Associate Professor Niamh O'Meara, a mathematics educator in the School of Education and Deputy Director of EPI-STEM The National Centre for STEM Education.

There are three phases to this project.

Phase 1: This phase will involve a systematic audit of a range of QQI modules delivered in ETBs nationally. Modules which have high uptake among adult learners will be prioritised (e.g. horticulture; managing personal finances; health & fitness etc). This review will include analysis of module descriptors alongside interviews with ETB Literacy/ Numeracy Co-ordinators that will help identify the numeracy learning opportunities that are implicit in the course content, which will strengthen numeracy in authentic, learner-centred ways that align with the course content.

Phase 2: This phase will focus on the development of practical numeracy resources for learners, along with tutor guideline handbook. The resources will include numeracy tasks/questions that can be used to support numeracy development in specific modules that may not primarily focus on numeracy. The numeracy tasks will relate to real life contexts that are meaningful for adult learners and help develop confidence and understanding of how numeracy is relevant beyond the mathematics classroom.

Phase 3: The final phase of the project will involve a professional learning event for adult tutors, demonstrating how to use the aforementioned resources effectively in practice. These workshops will be facilitated by the project team and will support adult tutors in developing their knowledge and skills of how best to support numeracy development in the module they lead.

In summary, Numeracy in Practice: Embedding Numeracy across Adult Education aligns closely with key national policy priorities, namely Ireland's Literacy, Numeracy and Digital Literacy Strategy 2024-2033 and the Adult Literacy for Life (ALL) Strategy. In particular, the project directly addresses shared goals around strengthening numeracy provision, building tutor capacity, and embedding numeracy across learning programmes rather than treating it as a skill developed in a separate module. The project team are strong advocates for numeracy learning for all and are committed to supporting inclusive and meaningful numeracy development. This project is grounded in the belief that numeracy is a critical life skill that enables adults to participate fully in education, work, and society.

Research Funding Amount: €40,303

EPI·STEM SUPPORTS SUMOBOT STEM EXPERIENCE

On Monday, 27th April 2026, Dr Sean O'Connor led an EPI·STEM sponsored SUMOBOT STEM EXPERIENCE for student teachers in their third year of the Bachelor of Education in Graphics, Engineering and Technology (LM095) course. The SumoBot Tournament was an important event for the engineering and technology student teachers and provided a unique opportunity to share their learning. The STEM experience was delivered as part of a Design & Technology module in students' second semester.

The EPI·STEM sponsored SUMOBOT STEM EXPERIENCE event challenged the technology teachers to work collaboratively to design, build, and test a remote-control robot that had capacity to compete in a sumo-style wrestling match against robots designed by their peers.

Throughout the immersive learning experience, the student teachers developed STEM-related skills (e.g. problem-solving and critical thinking) and competencies (e.g. collaboration and communication), while simultaneously enhancing their knowledge in areas including electronics and control systems. The SUMOBOT tournament was designed to provide a platform for the student teachers to share their growing expertise and to motivate them by providing a tangible goal, encouraging creativity, innovation and a healthy sense of cooperation and competition.

From a pedagogical perspective, the module followed a problem-based learning approach, encouraging the student teachers to investigate authentic engineering challenges and to develop solutions through collaboration and iterative design. This type of immersive experience places the student at the centre of their learning process and positions the teacher educator/teacher as an expert guide in an advanced professional practice. The success of this SUMOBOT STEM EXPERIENCE is clear to see from the animated photographs of the students and their engagement with their lecturer Dr Sean O'Connor.



EPI-STEM SUPPORTS SUMOBOT STEM EXPERIENCE

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**SUMOBOT CHAMPIONS
CATHAL EGAN & KAREN DUFF WITH
THEIR SUMOBOT 'THE CHEESE
GRATER'**



ENGAGED STEM LEARNERS



DR SEÁN O'CONNOR



THE FULL CLASS GROUP AT SUMOBOT CHAMPIONSHIPS IN STEM EDUCATION

EPI•STEM, The National Centre for STEM Education at the University of Limerick, and SEROSEP, a Limerick owned laboratory diagnostics and environmental testing company, have established a STEAM education school-university-enterprise partnership designed to connect real world scientific practices with second level classrooms in interesting ways. The project aligns SEROSEP's operations and processes with the national science curriculum. The project uses active learning and problem-based approaches to enhance students' engagement with scientific investigation. Working alongside a dedicated research team in EPI•STEM, led by Dr Michelle Starr, Martha Cosgrave, a PhD researcher in Science Education at EPI•STEM, spent time in SEROSEP gaining first-hand experience of the company's operational environment. The resource under development will not only deepen students' understanding of STEM concepts but will broaden their awareness for future citizenship and career pathways.

The STEAM approach intertwines societal values with STEM learning and enables engagement with issues of equality, care, and social justice, empowering learners not only to solve problems but to critically evaluate and reimagine the systems that shape them. This cultivates scientific literacy, ethical awareness, and a felt sense of collective responsibility — contributing to a more sustainable and equitable society.

Founded in 1997 by Dermot and Noreen Scanlon, SEROSEP has grown into a leading innovator in diagnostic testing. Dermot is a UL graduate with a BSc in Industrial Chemistry (1985). Operating from a state-of-the-art facility in Annacotty Business Park, Limerick, SEROSEP manufactures more than 1.25 million tests annually. Its operations span research and development, design, manufacturing, and global sales, supplying branded products to over 35 countries. The company employs 115 staff across four locations: Limerick, Crawley (UK), South Carolina (USA), and Johannesburg (South Africa). SEROSEP flagship EntericBio® system has transformed the identification of gastroenteritis in clinical laboratories and is now the market leader in Ireland and the UK, with expanding adoption in New Zealand, South Africa, and other regions.

In 2020, SEROSEP responded rapidly to the Covid 19 pandemic by developing RespiBio®, a PCR diagnostic test produced in record time to ensure critical test kit supply for hospitals across Ireland and the UK. In addition to partnership with EPI•STEM, SEROSEP collaborates with SSPC, the Research Ireland Centre for Pharmaceuticals, sponsors UL's Industrial Biochemistry Awards and has contributed to the "Periodic Table of Elements" installation at the Department of Chemical Sciences.

The EPI•STEM-SEROSEP-STEAM education resource will be available free of charge in early autumn to all STEM teachers and schools in Ireland by registering with the online EPI•STEM ACADEMY OF STEM TEACHERS see link: www.epistem.ie/resources/ . Contact Dr Michelle Starr at michelle.starr@ul.ie if you need additional information.



Limerick Students Showcase Visionary Eco-Village Designs at University of Limerick Awards Ceremony

More than 40 students from six Limerick post-primary schools gathered in the Foundation Building at the University of Limerick to present their visionary designs for a sustainable Ireland in 2050. The occasion marked the Awards Ceremony of the “Design a Sustainable Village in Ireland for 2050” project—an ambitious STEAM education initiative that brings together schools, universities, and museums to tackle one of the most pressing challenges of our time: building a just and sustainable future.

Launched officially by Councillor Pádraig Reale, deputising for Mayor John Moran, the event celebrated the innovation, creativity, and environmental leadership of students from Castletroy College, Coláiste Chiaráin, Crescent College Comprehensive SJ, Coláiste Nano Nagle, St. Munchin’s College, and Thomond Community College. Each student team presented their concept of an eco-village through a range of engaging formats including posters, videos, and physical artefacts. These designs reflected deep thinking around green housing, public infrastructure, renewable energy, biodiversity, and inclusive community spaces—all developed with a 2050 vision in mind.

“We are at a crucial crossroads in Ireland and Europe today,” said Professor Geraldine Mooney Simmie, Director of EPI•STEM, the National Centre for STEM Education. “The young people today have shown just how innovative they can be when it comes to finding sustainable solutions to the problems of green housing, public infrastructure and energy.”

The students’ visionary projects were also exhibited in the Hunt Museum throughout the month of April, offering the wider public a unique opportunity to engage with their ideas. This exhibition not only showcased the students’ creativity and research but also invited the public to reflect on what a sustainable Ireland might look like—and to have their own voices heard in shaping that future.

The project’s unique strength lies in its cross-curricular and collaborative approach. A team of twelve dedicated teachers from diverse disciplines—including science, engineering, chemistry, coding, art, economics and social sciences—guided the student groups in their research and design process. While the majority of participants were Transition Year students, one group of Second Year students also took part, reflecting the broad educational reach of the initiative.



The project is a partnership between:

EPI•STEM, National Centre for STEM Education, University of Limerick
The Hunt Museum, Limerick , Limerick Education Support Centre

It is co-led by Professor Geraldine Mooney Simmie and Dr. Michelle Starr (EPI•STEM), in collaboration with Maria Cagney (Curator) and Emma King (Education Officer) of the Hunt Museum, and Norma O'Brien, Director of the Limerick Education Support Centre.

Students were invited to imagine a future where environmental and social justice shape daily life in Irish villages. Their work not only highlighted sustainable architecture and green technologies, but also prioritised inclusivity, community wellbeing, and democratic participation—placing people and planet at the centre of their designs. This school-university-museum-education centre partnership underscores the transformative role education plays in addressing real-world problems and fostering leadership among youth.

The project benefited greatly from the support of Veronica Ryan from Cloughjordan Eco Village, one of Ireland's leading intentional sustainable communities. Veronica shared her expertise through an educational video (available on epistem.ie), offering students a real-life example of how eco-villages operate in practice. Her insights into community living, renewable energy, local food systems, and sustainable design provided valuable inspiration and context for the students as they developed their own visions for a sustainable village in Ireland for 2050.

The awards ceremony was made possible by the generous support of five local enterprises: Analog Devices, Boston Scientific, Eli Lilly, ESB, and Serosep. These sponsors recognised the importance of empowering young people to lead Ireland's green transition.

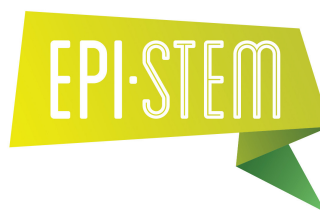
Adding a special touch to the day was a video message from Dermot Bannon, architect and RTÉ One personality, who praised the students for their innovative ideas and commitment to designing a better future.

"By imagining a sustainable Ireland in 2050," said Dr. Michelle Starr, "these students are proving that the next generation is ready to take on the complexities of building a greener and more inclusive society."



Coláiste Chiaráin Croom Showcasing their ECO Village

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National Centre for STEM Education



EPI•STEM Affiliates & Associations

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We continue to grow our network of affiliates and associates in Ireland.



EPI•STEM THE NATIONAL CENTRE FOR STEM EDUCATION

invites you to become an EPI•STEM Affiliate to support the vision, research, innovation and public engagement activities of the research centre as it leads out:

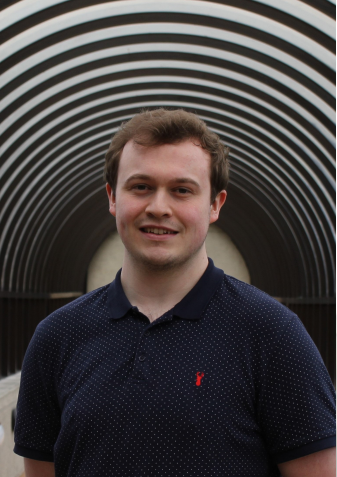
STEM AND STEAM TEACHER KNOWLEDGE & CONTINUING PROFESSIONAL DEVELOPMENT (CPD)

FOR YOU Your Research is widely distributed and you have access to our resources, networks and conference facilities.

FOR US We showcase EPI•STEM as an outstanding research centre of key national importance in leading out cutting-edge research

WHAT WE NEED Your name, title and affiliation and a short biography of 120-150 words, a link to your research and a photograph.

JOIN TODAY and forward your details by return to helen.fitzgerald@ul.ie



A. Major National Programme Funding

Department of Education & Youth (DEY)
Programme: PDMT Version 2
Duration: 2021–2025
Total Value: €5,310,500

National professional development programme supporting teacher education and upskilling.
Student participation by year:

- 2021 (Year 1): 115 students
- 2022 (Year 2): 200 students
- 2023 (Year 3): 213 students
- 2024 (Year 4): 143 students
- 2025 (Year 5): 146 students

B. European Funding

Erasmus+ KA220 HED – Cooperation Partnerships in Higher Education (Call 2025)

Project Title: Integrating Gender, Diversity and Inclusion in Teaching and Research in Math Intensive STEM Fields

Funding Body: European Commission (Erasmus+)

Value: €33,025

Duration: From 2025

Principal Investigator: Dr Regina Kelly, Associate Professor

European cooperation project addressing inclusive pedagogies and research practices across math intensive STEM disciplines in higher education.

C. Competitive Research & Evaluation Grants

Irish Research Council

Project: Examining Cognitive and Non Cognitive Factors Associated with Gendered Engagement and Performance in STEM

Grant Code: GOIPG/2024/3153

Value: €119,000

Duration: 2024–2026

Principal Investigator: Dr Jason Power, Associate Professor

Research examining gendered variance in learning experiences and performance among engineering students, with a focus on cognitive and non cognitive factors.

Decorative wavy lines in a dark green color at the bottom of the page.

Science Foundation Ireland (SFI)

Project: MathsMinds

Value: €59,868

Duration: 2024–2026

Principal Investigator: Dr Aoife Guerin, Assistant Professor

Design and development of inclusive eLearning mathematics modules for primary learners, delivered through a research–practice partnership (RPP) involving schools, universities, and industry stakeholders. Final report due Summer 2026.

Enterprise Ireland

Project: Predicting Engineering Dropout Using Machine Learning

Value: €14,214

Duration: 2023

Principal Investigator: Dr Jason Power, Associate Professor

Support grant awarded to UL to develop a European Research Council (ERC) funding concept. Funding supported an international expert team and feasibility work for ERC submission.

Education & Health Sciences Seed Fund

Project: Development of fNIRS based research on spatial abilities

Value: €4,860

Duration: 2023

Principal Investigator: Dr Jason Power, Associate Professor

Funded a two week research residency at Michigan Technological University and Northwestern University to support international collaboration and grant development.

D. Education, Policy Lifelong learning & Global Citizenship Research

Irish Aid / Ubuntu Network Partnership

Project: Nurturing Global Citizenship Education in Initial Teacher Education at UL

Value: €89,292

Duration: 2023–2026

Principal Investigator: Dr Keelin Leahy, Associate Professor

Research supporting the embedding of Global Citizenship Education as a core element of initial teacher education.



HEA PATH 1 Programme

Project: School of Education Study on Student Engagement & Experience (SOESEE)

Value: €119,674

Duration: 2022-2026

Role: Co Principal Investigator

Co PI: Dr Keelin Leahy, Associate Professor

Mixed methods study investigating student engagement and experience in higher education.

DAAD - Programme International Teaching / Lehramt International

Project: INVITE – International Networking for Virtually Improved Teacher Education

Duration: 2021-2024

Principal Investigator: Ludwigsburg University of Education, Germany

Role: International Partner (UL), Dr Keelin Leahy, Associate Professor

Funding Note: Budget held by German partner

Adult Literacy for Life - Collaborative and Innovation Fund (Ireland)

Project: Numeracy in Practice: Embedding Numeracy Across Adult Education

Funding Value: €40,303

Award Date: March 2026

Duration: National project (as per ALL funding cycle)

Role: Consortium Partner (University of Limerick)

Co PI: Dr Niamh O'Meara, Associate Professor

Partner Institutions: University of Limerick, University of Galway, University College Cork



E. Industry, Fellowship & Enterprise Funding

Eli Lilly & Research Ireland Enterprise Fellowship Programme

Value: €142,487.74

Duration: 2026

Funding Type: Industry-Academic Fellowship

Supports collaborative research training and applied scholarship bridging academic research and industry practice.

Title: Advancing STEAM education in post-primary school in Ireland through a school-university- enterprise partnership: interactive simulations to empower inclusive and problem-based learning and skills for a sustainable green and digital transition

Principal Investigators: Professor Geraldine Mooney Simmie, Director EPISTEM, Dr Michelle Starr, Liaison & Research Officer, Dr Vo Van De, Post Doctoral Researcher

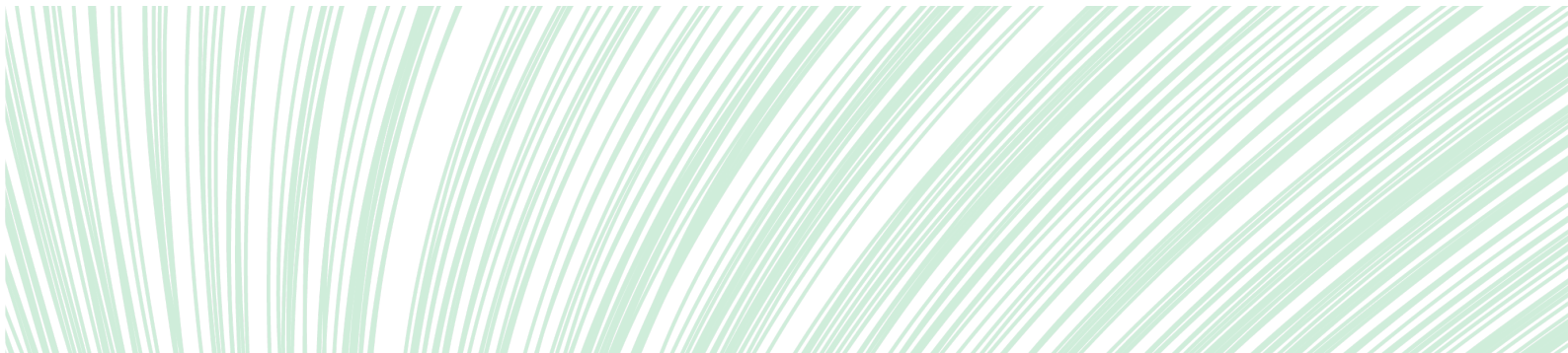
F. Industrial Sponsorship & Applied Industry Funding

Industrial Sponsorship – Eco Village Schools Project

Year: 2025

Sponsor	Amount
ESB	4,500
Eli Lilly	3,000
Boston Scientific	500
Analog Devices	1,000
TOTAL	9,000

Supports sustainability focused educational outreach, student engagement, and industry-education collaboration



Additional Industry Funding **SEROSEP (2025): €10,000**

Applied funding supporting evaluation and research activity (Martha Cosgrove PhD Student)

G. Internal University of Limerick Funding

UL Science Week Evaluation Funding

Year: 2025

Value: €4,000

Lead: Dr Michelle Starr

EHS Faculty Funding (AF)

Year: 2025

Value: €3,029.71

Lead: Associate Professor Aishling Flaherty

Internal Research Centres Funding Award (IRCFA 2024)

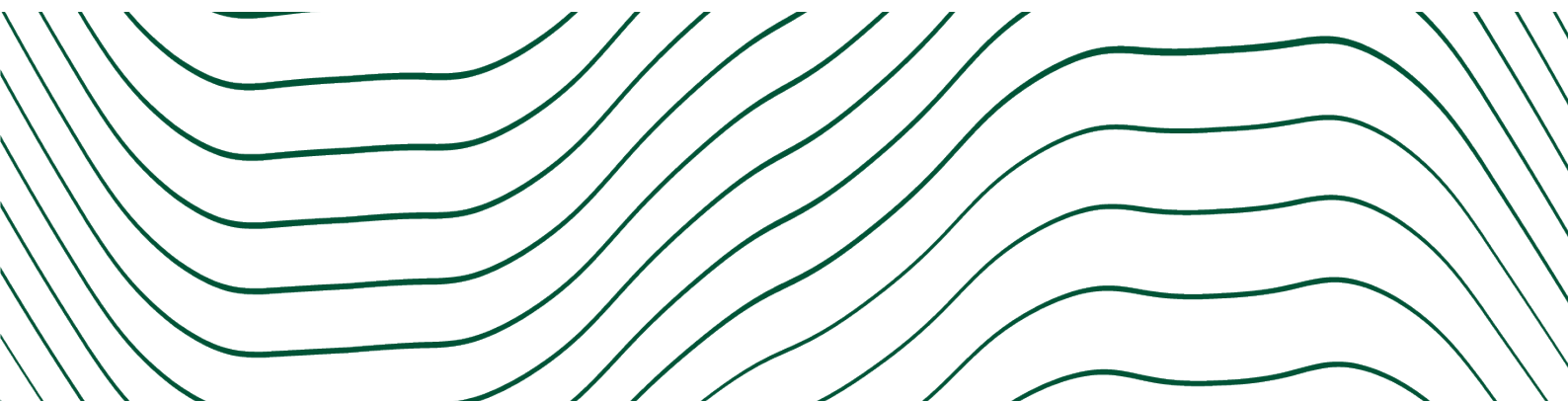
Purpose: Research Assistant Appointment [on-line Academy of STEM Teachers]

Value: €50,000

Year Funded: 2026

Principal Investigators: Prof G Mooney Simmie, Dr Michelle Starr & Samuel Brzyskiewicz

Total Value of Research & Innovation Funding:
≈ €6 million





EPI•STEM Podcasts

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LINKS TO THE EPI•STEM POD-CAST ON SPOTIFY



<https://open.spotify.com/show/3jkEuPWIS32Wg1iz55F6fh>

The EPI•STEM PODCAST discusses contemporary issues in relation to Research & Social Outreach projects relevant to the national curriculum of STEAM Education in Ireland.

The EPI•STEM PODCAST is co-hosted by Geraldine Simmie, Professor of STEM Education, Director of EPI•STEM and Dr. Michelle Starr, Research Liaison Officer at EPI•STEM. Each EPI•STEM PODCAST lasts 20 minutes approximately and concludes with a specially selected music piece from the Irish World Academy of Music and Dance at the Faculty of Arts and Humanities, University of Limerick.

The EPI•STEM podcast discusses STEM (Science, Technology, Engineering and Mathematics) educational research and applications for inquiry-oriented classroom teaching (second-level schools) and for upskilling teachers' professional learning. Together with our guests, co-hosts Geraldine Simmie PhD and Michelle Starr PhD open new spaces to discuss all aspects of STEM practices including connectivity with the Arts (e.g. Ethics, Music, & Politics). STEAM Education can interrupt the discourse to inspire a new imagination and new inclusive pedagogical practices, materials and technologies for an expansive view of the multiple purposes of education e.g. for personal development, intellectual growth, moral development and wellbeing, the greater good of society, a thriving economy, a just democracy and a sustainable local environment and planet.



EPI•STEM Podcasts

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LINKS TO THE EPI•STEM POD-CAST ON APPLE



<https://podcasts.apple.com/us/podcast/epistem-podcast/id1775149946>

EPI•STEM collaborates internally with 40 affiliates from the School of Education, The Faculty of Education and Health Sciences, Faculty of Science & Engineering, The Irish World Academy of Music and Dance, Faculty of Arts and Humanities. We work with local enterprises {e.g. Analog, Serosep}, with community-based partners (e.g. Limerick Education Support Centre; local schools; national policymakers; Hunt Museum in Limerick City; and Cloughjordan Eco-Village in Co. Tipperary) and with national partners (Department of Education) and European funded projects.

We nationally manage our flagship programme, The Professional Diploma in Mathematics for Teaching (PDMT), 2012 to date, for upskilling math teachers. The PDMT is a national partnership programme in teacher knowledge with seven Higher Education Institutes and is fully funded by the Department of Education and accredited by the University of Limerick and the Teaching Council.

Episode 1 features Katelyn O'Neill, EPI•STEM Research Assistant and initial teacher education student, discussing the Design a Sustainable Eco Village in Ireland 2050 project and its pedagogical aims.

Episode 2 sees the hosts reflecting on the Eco Village project across nine schools, with discussion of data literacy and innovative approaches to green energy, including piezoelectric cycle lanes.

Episode 3 features Lauren O'Gorman, research assistant and teacher, focusing on inspiring public infrastructure and climate action and sustainability initiatives in schools.

Episode 4 explores the aims of Transition Year, engagement with Sustainable Development Goals (notably SDGs 17 and 10), and holistic approaches to STEAM learning.

Episode 5 includes Emma King of the Hunt Museum, discussing museum based workshops, sustainable fashion, and learning from historical innovation.

Episode 6 features Associate Professor Regina Kelly, addressing physics education, gender gaps in STEM, and WiSTEM2D research.

Episode 7 introduces critical sociology in STEM education, engaging with thinkers such as Bourdieu, Freire, Lynch, Ball, and Greene.

Episode 8 features Associate Professor Olivia Fitzmaurice, including discussion of a letter from President Michael D. Higgins and approaches to teaching mathematics for understanding.

Episode 9 includes Dr Avril McLoughlin of the Irish World Academy, discussing community music, arts-STEM synergies, and STEAM education.

Episode 10 features Tara E. Ryan of the ACTUATE Lab, focusing on piezoelectricity and sustainable energy research.

Episode 11 features Norma O'Brien, Director of the Limerick Education Support Centre, discussing school partnerships and continuing professional development.

Episode 12 features Associate Professor Jason Power, focusing on engineering education, student self efficacy, and research collaboration.

Episode 13 includes Associate Professor Donal Canty, exploring formative assessment and pedagogies in Technology Education.

Episode 14 features Associate Professor Niamh O'Meara, discussing mathematics teacher knowledge, numeracy, and policy engagement.

Episode 15 reflects on how global trade tariffs shape educational aims, with attention to care and justice in a changing socio political context.

Episode 16 features Edel Farrell and students from Coláiste Chiaráin, discussing Transition Year learning through the OCTO_ECO_VILLAGE design project.

Episode 17 includes Shaun Donegan and students from Thomond Community College, focusing on democratic village design and engagement with the Sustainable Development Goals.

Episode 18 features Conor Bourke and students from Coláiste Nano Nagle, discussing eco village design and gender equality (SDG 5).

Episode 19 features Professor Sara Tolbert (Monash University and University of Canterbury), discussing science education in the Anthropocene and the development of impact labs.

Episode 20 includes Associate Professor Diarmaid Lane, focusing on design thinking pedagogies and reflexive teaching in Technology Education.

Episode 21 offers host reflections on voices represented in the series to date, linking Bourdieu's work (Starr) and critical policy studies (Simmie) to doctoral research.

Episode 22 discusses an EU scoping study on education and skills for a fair green and digital transition, alongside teacher CPD resource development.

Episode 23 features Associate Professor Audrey O'Grady, discussing entomology outreach, the ROOTS tree project, and hands on science education.

Episode 24 includes Dr Jeff Buckley (TUS) and Dr Jason Power, discussing an edited book series and key themes in engineering education.

Episode 25 features Samuel Brzyskiewicz, discussing the EPI•STEM Academy of STEM Teachers and future CPD provision.

Episode 26 features Dr Martin McHugh (SSPC/Bernal Institute), focusing on public engagement, Science Week, and science education research.

Episode 27 features Professor Laura Colucci Gray (University of Edinburgh), discussing arts in science education, affect, and the Garden project.

Episode 28 features Professor Sarah Hudson, Director of the Bernal Institute, discussing interdisciplinary research and national chemistry outreach.

Episode 29 features Assistant Professor Patrick J. Dundon, focusing on science teaching, assessment roles, and teacher education research.

Episode 30 features Dr Sarah Hayes, Chief Operating Officer of SSPC, discussing science engagement, Transition Year science, and chemistry pathways.

Episode 31 features Associate Professor Nicolaas Blom, discussing creativity in design education, metacognition, and learning from Indigenous communities.

Episode 32 features Professor Marilyn Goos and Associate Professor Niamh O'Meara, focusing on teacher upskilling and numeracy across the curriculum.

Episode 33 With Assoc. Prof. Keelin Leahy and her passion for Wood, Technology and Design in teacher education and learning.

Episode 34 With Professor JJ Leahy, Head, Department of Chemical Sciences and his research interest in environmental chemistry and sustainability.

Episode 35 With Dr Michaela Hayes, a University Teacher in Technology Education in UL, and her passion for technology pedagogies for the common good of society and for sustainability.

Episode 36 With Eoin McNamara, Technical & Outreach Officer in the Department of Chemical Sciences in UL and his doctoral study on the question of human need in laboratory design.

Episode 37 With Manus McDyer, University Teacher of Technology Education in UL and his doctoral study on the question of design thinking in technology education.

Episode 38 With Eamonn Stack Mulvihill, an Associate Teacher in the School of Education in UL, and his doctoral dissertation on the question of integrated-STEM learning.

Episode 39 With Liam Maquet, Assistant Professor of Technology Education in the School of Education and his doctoral research on pedagogies of spatial reasoning.

Episode 40 With Professor Sibel Erduran at the University of Oxford in the UL and her passion for a futures-oriented science education in an AI era.

Meet the EPI-STEM Team



PROFESSOR GERALDINE MOONEY SIMMIE
PROFESSOR OF STEM EDUCATION & DIRECTOR OF EPI-STEM



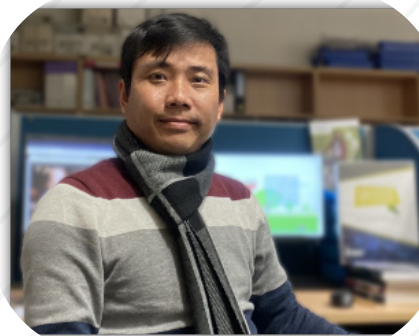
ASSOCIATE PROFESOR NIAMH O'MEARA
SENIOR LECTURER IN MATHEMATICS EDUCATION, DEPUTY DIRECTOR OF EPI-STEM



HELEN FITZGERALD
SENIOR EXECUTIVE ADMINISTRATOR



DR MICHELLE STARR
RESEARCH LIAISON OFFICER



DR VO VAN DE
POST DOCTORAL RESEARCHER



SAMUEL BRZYSKIEWICZ
RESEARCH ASSISTANT (ACADEMY OF STEM TEACHERS)



TRACEY O'CONNELL
NATIONAL PROGRAMME COORDINATOR (PDMT)



CLIODHNA O'NEILL
NATIONAL PROGRAMME ADMINISTRATOR(PDMT)



DAVID GODLEY
PHD STUDENT N MATHS EDUCATION

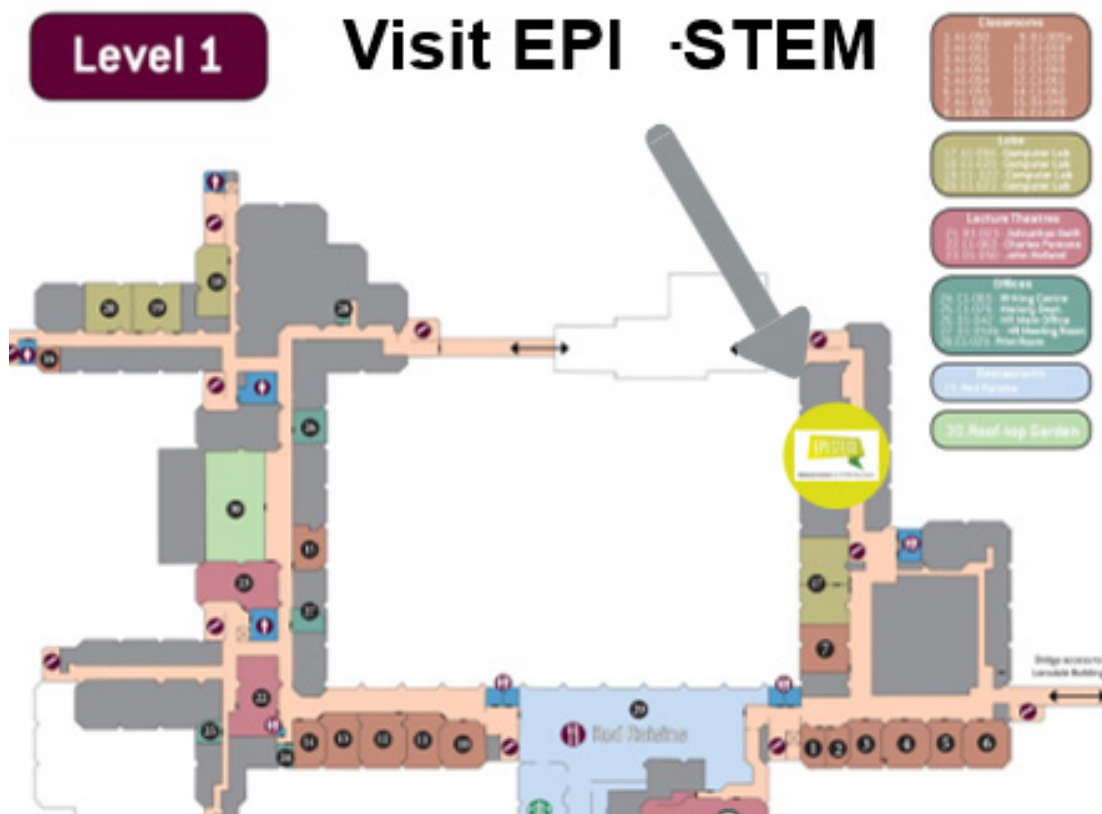
www.epistem.ie

e-mail: epistem@ul.ie

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Main Building



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Room A1064



New Mathematics resources in CALCULUS and accompanying supplements have been added to our online platform the EPI-STEM ACADEMY OF STEM TEACHERS

Dear EPI-STEM Academy Member,

We are pleased to inform you that three new Mathematics resources in CALCULUS and accompanying supplements have been added to our online platform the EPI-STEM ACADEMY OF STEM TEACHERS (see link below).

These research-led CPD resources for math teachers of senior cycle created by Dr Jason Curran (EPI-STEM & Dept. Maths & Stats, UL) are available under the Mathematics Education category and within the Calculus CPD Presentations and Supplementary CPD Resources folders and include the following:

Main files

- CPD #7 Differential Calculus
- CPD #8 Functions in Calculus
- CPD #9 Integral Calculus

Supplements

- Application of Differentiation (MaxMin Problems)
- Average Value
- Chain Rule

We encourage you to explore these new materials and adapt them to support your practice. As always, we welcome any feedback you may have.

You can access the EPI-STEM ACADEMY OF STEM TEACHERS using the link below:

[EPI-STEM ACADEMY OF STEM TEACHERS. – Epi-STEM | National Centre for STEM Education](#)

Thank you for your continued engagement with EPI-STEM The National Centre for STEM Education in the School of Education in UL and your commitment to STEM education.

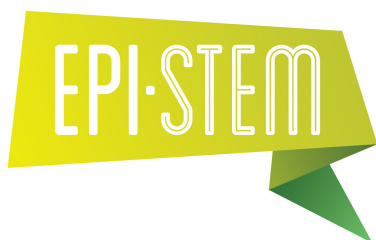
Samuel Brzyskiewicz
Research Coordinator of the EPI-STEM ACADEMY OF STEM TEACHERS
EPI-STEM The National Centre for STEM Education,
School of Education, Faculty of Education and Health Sciences,
Room A1-064b, University of Limerick.
Email: samuel.brzyskiewicz@ul.ie



New Calculus Resources



Explore the latest mathematics resources today!



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