

JASON POWER - CURRICULUM VITAE

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Engineering education lecturer with a proven track record in academic leadership, funding procurement, teaching excellence and international research collaborations. Currently PI of EU funded international project examining evidence based practice in tertiary engineering education environments.

Education:

- 2012-2016 University of Limerick, Ph.D. *An Examination of the Influence of Task Difficulty on Engagement, Performance and Self-Efficacy Formation within a Computerised Maze Navigation Task,*
- 2008-2012 University of Limerick, First Class Honours, Bachelor of Technology (Education) in Materials and Engineering Technology.

Previous Employment:

July 2018 – Present: Lecturer, School of Education, University of Limerick

Invited to undertake Course Directorship of Bachelor of Technology (Education) in Materials and Engineering Technology. The enhancement of course design and delivery has been repeatedly noted by the External Examiner to be a consequence of my leadership and these commendations are reflected in annual internal evaluations.

Jan 2018 – July 2018: Lecturer, School of Engineering, University of Limerick

Primary responsibilities include the design and delivery of a module on the engineering common entry program which has been highlighted by industry and the accrediting body, Engineering Ireland, as being exemplary in design and delivery. I also contributed to the design and delivery of a mechatronics Masters level program which has received international awards related to its pedagogical design. In addition, I served on the Marketing and Outreach Committee, the Teaching and Learning Committee, Technology Management (Bch) and Mechatronics (MEng) course boards. Current related research includes a project examining factors related to performance and retention of undergraduate engineering students.

September 2016 - December 2017: Research Fellow, Faculty of Mechanical Engineering, Michigan Technological University

Primary responsibilities included data management, design of collection systems, co-ordination of data input, data analysis, fidelity inspections, grant proposal contributions and dissemination. As a result of this role I am currently responsible for the design and management of a spin-off research project involving academics from University of Cincinnati, North-western University, Florida State University and University of California.

September 2014 - Aug 2016: Lecturer, Faculty of Science and Engineering, University of Limerick

Responsible for the design, delivery and oversight of first year modules that catered to students from Aeronautical, Bio-medical, Product Design and Mechanical Engineering courses. The degrees in question facilitated industry links with Modular Automation and Johnson & Johnson who continue to provide collaborative opportunities due to the CDIO based design of the modules. Modules were later accredited by Engineering Ireland.

June 2012 - Aug 2014: Teaching Assistant, Faculty of Science and Engineering, University of Limerick

Responsible for assessment and pedagogical design for a range of engineering modules that catered to Initial Teacher Education programs as well as core engineering programs.

Research Experience:

2020 – 2023 PI of Erasmus+ Link number: 2020-1-IE02-KA226-HE-000765

2021- Special Edition Guest Editor of the Journal of Engineering Education

Guest editor for a special call edition focused on systematic reviews and meta-analyses in Engineering Education.

2021 – Present: Associate Editor of the European Journal for Engineering Education

Invited member of editorial board on the basis of international excellence in pedagogical research and practice. Duties include the management of reviews, recruitment and co-ordination of reviewers, design and development of special editions, membership of the steering committee and co-ordination of key strategic developments based on Open Science principles.

2020 – Present: Founder and current lead of the E³@UL research group

This initiative has led to multiple interfaculty collaborations, the development of an international research team and ultimately a successful Erasmus + grant application. This research group supports junior academics in the development of researching their pedagogical practice and in the application for funding of associated research projects.

Supervision Duties to Date

I have previously supervised 16 Masters level theses by committee, 4 Masters Students as sole supervisor, with an additional 8 Masters Students currently being supervised. I am also currently supervising 3 PhD students and act as primary for 2. Most recent primary student has secured competitive funding for his course of study.

2020 - Present: IRC Funded Residency

Using funds from a successful IRC grant application I am currently developing a transatlantic grant application with faculty from North-Western University Chicago, University of California, Los Angeles and Michigan Technical University. This grant application will build on previous collaborations [IES Grant: R305A150365] to examine non-cognitive factors related to STEM education performance. Due to COVID restrictions this residency will now take place in the summer of 2021 where grant submission will be finalised.

2020 - Erasmus Extra Ordinary Call: KA203 - Strategic Partnerships for higher education

I led a project team consisting of academics from KTH Sweden and Aachen University, Germany in a successful grant application resulting in a total award of €277,500. €133,000 will be awarded to UL as the

lead institution of which I am the PI. I designed the project and was primarily responsible for the submission. The project titled: *Development of Engineering Faculty for Innovation* is designed to enhance evidence informed practice in STEM learning environments at university level. The deliverables including multiple systematic reviews, a special edition of the *European Journal for Engineering Education* as well as a suite of professional development supports to enhance research of practice within tertiary STEM.

2017-Present: Research Consultant, Cincinnati University

My ongoing collaboration with multiple American Universities is primarily facilitated by Cincinnati University. The large-scale randomised control trial study examines a school level intervention designed to enhance spatial reasoning skills. I contributed major sections, relating to self-regulation and motivation theory, to the initial grant application. Work on this project has provided an opportunity to develop a wide range of research skills including data analysis, fidelity inspection, Institutional Research Board procedures and large-scale grant applications. In addition, I designed and currently manage a sub-award meta-analysis project examining reported relationships between mathematical and spatial skills. This project was designed in line with PRISMA standards, was the first of its kind globally and has resulted in a new SEM technique arising from collaborations with internationally renowned specialist, Prof. Terri Pigott. Future collaborations will be developed using recently secured IRC funding.

2016-2017: Postdoctoral Research Fellow, School of Engineering, Michigan Technical University

Primary responsibilities include data handling, analysis and dissemination for a large scale Institute of Education Sciences funded project. This included the management of data from tens of thousands of participants, liaising with partner institutions and reporting to oversight boards. Dissemination responsibilities were focused on the targeting of Q1 journals and practitioner outreach through professional association presentations.

Peer Reviewed Journal Publications:

- Power, J. R. Enhancing Engineering Education through the Integration of Open Science Principles: A Strategic Approach to Systematic Reviews (2021) *Journal of Engineering Education* <https://doi.org/10.1002/jee.20413> [Imp: 2.638, Q1]
- Power, J. R., Sorby, S. A. Spatial development program for middle school: Teacher perceptions of effectiveness (2020). *International Journal of Technology and Design Education* DOI: <https://doi.org/10.1007/s10798-020-09587-w> [Imp: 1.39, Q1]
- Atit, K., Power, J. R., Sorby, S., Uttal, D. H., Carr, M., Veurink, N., Fiorella, L., & Msall, C. (2020). Examining the role of spatial skills and math motivation in predicting middle school math achievement. *International Journal of STEM Education* [IES Grant: R305A150365] DOI: <https://doi.org/10.31234/osf.io/xgkep> [Imp: 2.403, Q1]
- Power, J. R., Tanner, D., Ryan, A. & Devitt, B., (2019) Developing CDIO Practitioners: A Systematic Approach to Standard 10. *Procedia Manufacturing* DOI: <https://doi.org/10.1016/j.promfg.2020.01.087> [SNIP: 0.855, Q2]
- Power, J. R., Lynch, R. & McGarr, O., (2019). Difficulty and Self-efficacy: Implications for Game Design. *British Journal of Educational Technology* [Imp: 2.41] DOI: <https://doi.org/10.1111/bjet.12755>
- Buckley, J., Seery, N., Power, J. R. & Phelan, J. (2018). The importance of supporting technological knowledge in post-primary education: A cohort study. *Research in Science and Technological Education* DOI: <https://doi.org/10.1080/02635143.2018.1463981> [Imp: 0.676]

Peer Reviewed Conference Papers:

- Tanner, D. & Power, J. R., (2019) Combined strategies to promote active learning and retention. *International CDIO Conference*, Aarhus, Denmark, June, 2019
- Duffy, G., Power, J., Sorby, S., & Bowe, B., (2018) Differentiating between Spatial Ability as a Specific Rather than General Factor of Intelligence in Performance on Simple, Non-routine Problems in Mathematics. *Engineering Design Graphics Division 70th Mid-Year Conference*, Montego Bay, Jamaica, January,
- *Power, J. R., Verunik, N., & Sorby, S., (2017). Preparing Students for Engineering Success Through Improving 3D Spatial Skills. *American Society for Engineering Education Annual Conference*, Columbus, OH, June, 2017
- Tanner, D. & Power, J. R., (2017) A Review of Implementation in a First Year Multi-Program Module. *International CDIO Conference*, Calgary, Canada, June, 2017
- Power, J., Buckley, J., Seery, N., & Canty, D. (2016). Investigating the Factor Structure of Pupils Attitudes Towards Technology. In M. de Vries, A. Bekker-Holtland, & G. van Dijk (Eds.), *PATT2016: Technology Education for 21st Century Skills* (pp. 391–399). Utrecht, Netherlands: PATT.
- *Power, J., Buckley, J., & Seery, N. (2016). Visualizing Success: Investigating the Relationship between Ability and Self-Efficacy in the Domain of Visual Processing. *ASEE Engineering Design Graphics Division 70th Mid-Year Conference* (pp. 73–79). Daytona Beach, Florida: EDGD

*Presented at event

Book Chapters:

- Power, J. R. 2020. The Influence of Task Difficulty on Engagement, Performance and Self-Efficacy. In: *Explorations in Technology Education Research – Helping Teachers Develop Research Informed Practice*, edited by J. P. Williams and D. Barlex. Melbourne: Springer. [ISBN 978-981-13-3010-0]

Digital/Print Media:

- Power, J. (2021). How much money will an electric car save you over 5 years? *RTE Brainstorm Series*. [Available at: <https://www.rte.ie/brainstorm/2021/0304/1200926-electric-car-operating-costs-savings/>] [Accessed 4 March 2021]
- Power, J. (2018). What do cobalt, coffee and diamonds have in common? *RTE Brainstorm Series*. [Available at: <https://www.rte.ie/eile/brainstorm/2018/0320/948719-what-do-cobalt-coffee-and-diamonds-have-in-common/>] [Accessed 16 July 2018]
- Power, J. (2018). Are you ready for Industry 4.0? *RTE Brainstorm Series*. [Available at: <https://www.rte.ie/eile/brainstorm/2018/0419/955765-are-you-ready-for-industry-4-0/>] [Accessed 16 July 2018]

Funding:

2021: Erasmus + link number - 2020-1-IE02-KA226-HE-000765. Total value €277,560 with €133,215 awarded to UL and the remainder split between Chalmers Tekniska Högskola Sweden and Aachen University Germany. I am the PI of the lead institution. I drafted the application, designed the overall project structure, timeline and budget. Funds will be used to buyout my time to manage the project, hire a postdoctoral researcher and deliver professional development events. The project will lead to a synthesis of evidence based practice suitable for use in tertiary STEM. This will take the form of a special edition of the *European Journal of Engineering Education* as agreed with the editorial panel.

2020: IRC New Foundations awarded €4,800 for a professional residency within North-Western University Chicago with the aim of creating a transnational grant application exploring performance influencing factors in tertiary STEM education. Due to the pandemic this will now be completed in the summer of 2022.

2020: PhD student, of whom I am the primary supervisor, secured Faculty funded bursary for duration of studies valued at €23,200. Research project will examine collaboration in online tertiary STEM learning environments.

2018: Secured a total of \$72,000 for an independent meta-analysis project sub-award from Federal Grant: R305A150365. \$46,000 allotted for personal buyout with the remaining funds used for buyout of four team members and support costs. I led the inter-institutional team comprised of academics from North-western University Chicago, University of California - Los Angeles, Michigan Technological University and Georgia State University.

Teaching Experience:

I was awarded the highest institutional recognition of teaching excellence, *The Shannon Consortium Award*, in 2016. This is reflected in my *Student Evaluations of Teaching and Learning* which exceed Faculty and institutional averages in all 5 sub factors in all 12 reviews, with the lecturer sub factor averaging over 90%. In addition, I have delivered multiple international sessions as an invited speaker on the topic of engineering pedagogies. My most recent was in the University of Aachen in early 2020 which gave rise to an inter-institutional evidence based practice research group which I now lead.

Sem/Yr	Module Code- Module Name	No.	Primary Delivery Strategies
2021	EN6914 ^{a c} – Research Trends and Future Pedagogy in Technology Education	10	- Negotiated Curriculum - Peer Based Assessment
2018 - 2021	PN4033 ^a - Process Technology 2	45	- Project Based Learning - Self-Assessment
2018 - 2021	PN4035 ^a - Process Technology 3	45	- Project Based Learning - Self-Assessment
2018 - 2021	PN4056 ^a - Design and Technology 3	45	- Project Based Learning - Blended Learning Environment
2018 - 2021	TP4014 ^b - School Placement 1	10	- Oversight of placement students
2018 - 2021	TP4017 ^b - School Placement 2	6	- Oversight of placement students
2018 - 2021	EN6094 ^{b c} - Reporting Educational Research	8	- Masters supervision of research projects and reporting
2018 - 2020	PN6003 ^{a c} - Subject Pedagogics 3 (Technology Education)	8	- Student Led Tutorials - Negotiated Curriculum
2018 - 2020	PN6004 ^{a c} - Subject Pedagogics 4 (Technology Education)	8	- Student Led Tutorials - Project Based Learning
2018 - 2019	ME4042 ^a - Introduction to Design for Manufacture	130	- Project Based Learning - Online Environment - Enhanced Peer Assessment and Feedback
2018 - 2019	DM6002 ^{a c} - Mechatronics Project 1	15	- Consultation and feedback meetings - Student defined support and training
2014 - 2016	PN4021 ^a - Process Technology 1	130	- Student Centred Lectures - Tutorials - Online Environment
2015 - 2016	PN4022 ^a - Design and Technology 1	60	- Student Centred Lectures - Tutorials - Online Environment
2015 - 2016	PN4105 ^a - Process Technology 3	50	- Student Centred Lectures - Student Lead Lectures - Online Environment
2014 - 2016	PT4112 ^a - Manufacturing Technology 2	100	- Case Study Lecture Series - Semi-Permeable Design Project - Formative Self-Assessment
2014 - 2016	PE4112 ^a - Production Technology 1	160	- Guest Lecture Series - Team Teaching - Problem Based Labs
2014 - 2016	PN4008 ^a - FYP Supervision	14	- Consultation and feedback meetings - Student defined support and training

2013 – 2014	EN5262 ^b - Teacher as a Professional	40	- Lectures - Discursive tutorials
2013 - 2014	EN5181 ^b - Prep. for School Placement	20	- Lectures - Tutorials
2013- 2014	EN4014 ^b - Technology and Society	40	- Reciprocal Reading - Lecture
2012 - 2013	PN4001 ^b - Technical Graphics 1	60	- Lab based PBL - Lecture
2012 - 2013	EN4024 ^b - Planning for Teaching and Learning 2	20	- Lecture - Tutorial
2012 - 2013	EN4031 ^b - Becoming a Teacher: Identity and Communication	20	- Lecture - Tutorial
2012 - 2013	EN4023 ^b - Planning for Teaching and Learning 1	20	- Lecture - Tutorial

^a Module co-ordinated. Primary responsibility for design, delivery and execution.

^b Taught on module in a support capacity. Control over module layout limited.

^c Masters level program

Awards:

- Irish Research Council New Foundations Award 2020
- Shannon Consortium Excellence in Third Level Teaching Award 2016
- University of Limerick Graduate School Research Bursary 2016
- American Society for Engineering Education Emerging Scholar Bursary 2015

Professional Affiliations:

- Associate Editor of the *European Journal of Engineering Education*
- Member of the American Society for Engineering Education
- Teaching Council of Ireland Registered
- Member of the National Spatial Skills Research Network
- Member of the Irish Manufacturing Council
- Member of the European Journal of Engineering Education steering group
- Lead of the E³@UL research group