

**Research Review 17/18**



Contents

[Research Outputs 1](#_Toc73535562)

[Research Review: Research Outputs 2017/18 1](#_Toc73535563)

[Introduction 1](#_Toc73535564)

[Books and Book Chapters 1](#_Toc73535565)

[Journal Articles 2](#_Toc73535566)

[Conference Presentations and Papers in Conference Proceedings 4](#_Toc73535567)

[Exhibitions and Performances 7](#_Toc73535568)

[Reports 7](#_Toc73535569)

[Research Student Completions 2017/18 8](#_Toc73535570)

[Research Grants and Contracts active in 2017/18 8](#_Toc73535571)

# Research Outputs

## Research Review: Research Outputs 2017/18

### Introduction

Glyndŵr University’s research is intended to contribute to economic, social and cultural development. Whether local or international, small scale or large, the emphasis is always on problem-solving and making a contribution to real needs.

This report gives an indication of the wide range of research and related activity undertaken by University staff.

These outputs of research include papers published in peer-reviewed journals, conference presentations, books, reports, performances and exhibitions.

This report also provides details of research student completions, and formal research grants and contracts active in 2017/18.

For more information about the research undertaken at Glyndŵr University please visit the [Our Research](http://www.glyndwr.ac.uk/en/Ourresearch/) page or call the **Research Services** office on 01978 293573.

You can view our online repository of research outputs at [Glyndŵr University Research Online](http://collections.crest.ac.uk/view/divisions/GlyndwrUniversity/)

GURO gives free access to the outputs of the research and scholarship of the academic and research staff of the University, where not otherwise prevented by copyright restrictions. The University positively encourages external organisations and individuals to make use of its research results and to cooperate in its research efforts.

*Stewart Milne*

*Head of Research Services*

### Books and Book Chapters

Arabi, O., Ali, N.T., Liu, B., Abd-Alhameed, A. and Excell, P.S. (2017), "Compact MIMO Antenna Array Design for Wireless Applications", in Elfergani, I. et al (Eds.), Antenna Fundamentals for Legacy Mobile Applications and Beyond. Springer. ISBN 978-3-319-63967-3

Liggett S. and Heald K., (2017) 'Visual Arts Mental health and Technology'. In Earnshaw, R. (Ed) Art, Design and Technology: Collaboration and Implementation, pp. 67-82, Springer. ISBN 978-3-319-58121-7

McMillan, A. (2017), 'Crack growth from naturally occurring material discontinuities', in Jones, R., Matthews, N., Baker, A.A. and Champagne, J. Jnr (Eds), Aircraft Sustainment and Repair, Chapter 5. Oxford: Elsevier/Butterworth-Heinemann. ISBN 9780081005408

Shepley, A (2018) 'Idiosynctratic spaces and uncertain practices: Drawing, Drifting and Sweeping Lines Through the Sand'. In Journeaux, J. and Gorrill, H. (Eds), Collective and Collaborative Drawing in Contemporary Practice: Drawing Conversations, pp 164-191. Newcastle-upon-Tyne: Cambridge Scholars. ISBN 978-1-5275-0347-2

### Journal Articles

Liu, B., Yang, H. and Lancaster, M. (2018), ‘Synthesis of Coupling Matrix for Diplexers Based on a Self-adaptive Differential Evolution Algorithm’, *IEEE Transactions on Microwave Theory and Techniques*, Vol. 66, No.2, pp.813-821. doi: 10.1109/TMTT.2017.2772855

Burr, S., Williams, P.A. and Ratcliffe, I. (2018), 'Synthesis of cationic alkylated chitosans and an investigation of their rheological properties and interaction with anionic surfactant', *Carbohydrate Polymers*, Vol.201, pp.615623. doi: 10.1016/j.carbpol.2018.08.105

Gorden, C., Hughes, C., Roberts, D., Astbury-Ward, E. and Dubberley, S. (2017), '*A Literature Review of Transgender People in Prison: An ‘invisible’ population in England and Wales*', Prison Service Journal, No.233, pp.11-22. Available at: https://www.crimeandjustice.org.uk/publications/psj/prison-servicejournal-233

Grout, V (2017), 'A Simple Approach to Dynamic Optimisation of Flexible Optical Networks with Practical Application', *Future Internet*, 9(2), 18. doi: 10.3390/fi9020018

Grout, V (2018), ‘The Singularity Isn’t Simple! (However We Look at It) A Random Walk between Science Fiction and Science Fact’, *Information*, Vol.9, No.4. doi: 10.3390/info9040099

Yang, H., Dhayalan, Y., Shang, X., Lancaster, M., Liu, B., Wang, H. and P. G. Huggard, (2018), ‘WR-3 Waveguide Bandpass Filters Fabricated Using High Precision CNC Machining and SU-8 Photoresist Technology, *IEEE Transactions on Terahertz Science and Technology*, Vol.8, No.1, pp.100-107. doi: 10.1109/TTHZ.2017.2775441

Han, L., Ratcliffe, I., and Williams, P.A. (2017), ‘Synthesis, characterisation and physicochemical properties of hydrophobically modified inulin using long-chain fatty acyl chlorides’, *Carbohydrate Polymers*, Vol.178, pp.141146. doi: [10.1016/j.carbpol.2017.09.008](https://doi.org/10.1016/j.carbpol.2017.09.008)

Hanson-Heine, M.W.D., Calladine, J.A., Yang, J., Towrie, M., Hovarth, R., Besley, N.A. and George, M.W. (2018), ‘A combined time-resolved infrared and density functional theory study of the lowest excited states of 9fluorenone and 2-naphthaldehyde’, *Chemical Physics*, Vol.512, pp.44-52. Doi: 10.1016/j.chemphys.2018.04.014

Jones, R., Singh Raman, R. K. and McMillan, A. J. (2017), 'Crack growth: Does microstructure play a role?', *Engineering Fracture Mechanics*, Vol. 187, pp.190-210. doi: 10.1016/j.engfracmech.2017.11.023

Kokubun, S., Ratcliffe, I. and Williams, P. (2018), ‘The interfacial, emulsification and encapsulation properties of hydrophobically modified inulin’, *Carbohydrate Polymers*, vol 194, pp.18-23. doi: 10.1016/j.carbpol.2018.04.018

Leong, K. and Sung, A. (2018) ‘FinTech (Financial Technology): What is It and How to Use Technologies to Create Business Value in Fintech Way?’, *International Journal of Innovation, Management and Technology*, Vol.9, No.2, pp. 74-78. Available at this [website](http://www.ijimt.org/index.php?m=content&c=index&a=show&catid=93&id=1138).

Liu, B., Grout, V. and Nikolaeva, A. (2018), 'Efficient Global Optimization of Actuator Based on A Surrogate Model Assisted Hybrid Algorithm', *IEEE Transactions on Industrial Electronics*, Vol.65, No.7, pp. 5712-5721. doi: 10.1109/TIE.2017.2782203

Livingston, W. and Perkins, A. (2018), 'Participatory action research (PAR) research: critical methodological considerations'*, Drugs and Alcohol Today*, Vol.18, No.1, pp 61-71. doi: 10.1108/DAT-08-2017-0035

Madoc-Jones, I., Lloyd-Jones, N., Owen, E. and Gorden, C. (2018), 'Assessing and addressing domestic abuse by Ex-armed service personnel', *Probation Journal*, Vol.65, No.2, pp.201-218. doi: 10.1177/0264550518768401

McMillan, A., Jones, R., Peng, D. and Chechkin, G.A. (2018), ‘A computational study of the influence of surface roughness on material strength’, *Meccanica*, Vol.53, No.9, pp.2411-2436. doi: 10.1007/s11012-018-0830-6

McMillan, A.J., Swindells, N., Archer, E., McIlhagger., Sung, A., Leong, K. and Jones, R. (2017), ‘A review of composite product data interoperability and product life-cycle management challenges in the composites industry’, *Advanced Manufacturing: Polymer and Composites Science*, Vol.3, No.4, pp.130-147. Doi 10.1080/20550340.2017.1389047

Miraz, M., Ali, M., Excell, P.S. and Picking, R. (2018), ‘Internet of Nano-Things, Things and Everything: Future Growth Trends’*, Future Internet*, Vol.8, No.10, 28 pages. doi: 10.3390/fi10080068

Surabhi, A., Senan, Ch. and Azhar, M. (2018), 'Effect of Temperature and Calcium Ion Concentration on Gelation and Rheological Properties of Low Methylated Pectin', *Asian Journal of Chemistry*, Vol.30, No.7, pp.1671-1674. doi: 10.14233/ajchem.2018.21321

Tekke, M., Francis, L. J. and Robbins, M. (2017), 'Religious affect and personal happiness: a replication among Sunni students in Malaysia', *Journal of Muslim Mental Health*, Vol.11, No.2. pp. 3-15. doi:10.3998/jmmh.10381607.0011.201

Turley, J., Lewis, C.A., Musharraf, S., Malik, J.A. and Breslin, M.J. (2018), 'Psychometric properties of three measures of “Facebook engagement and/or addiction” among a sample of English speaking Pakistani university students', International Journal of Mental Health and Addiction. doi: 10.1007/s11469-018-9963-z

Wyatt, M. and Liggett, S. (2018), 'The Potential of Painting: Unlocking Disenfranchised Grief for People Living With Dementia', *Illness, Crisis & Loss*, available online: 20 June 2018. doi: 10.1177/1054137318780577

### Conference Presentations and Papers in Conference Proceedings

Anuchin. A., Shpak, D., Zharkov, A. Ostrirov, V., and Vagapov. Y. (2017), 'A method of determining the maximum performance torque-speed characteristic for an induction motor drive over its entire speed range', in: *Proceedings of the 58th International Scientific Conference on Power and Electrical Engineering*. 12-13 October 2017, Riga. doi: 10.1109/RTUCON.2017.8124815

Bolam, R. C., Vagapov, Y. and Anuchin, A. (2017), ‘Curriculum development of undergraduate and post graduate courses on small unmanned aircraft’, in *Proceedings of the 52nd International Universities Power Engineering Conference*. 28-31 August 2017, Heraklion, Greece. doi: 10.1109/UPEC.2017.8232002

Bolam, R., and Vagapov, Y. (2017), 'Implementation of electrical rim driven fan technology to small unmanned aircraft’, in *Proceedings of the 7th IEEE Int. Conference on Internet Technologies and Applications ITA-17*, 12-15 September 2017, Wrexham, UK. doi: 10.1109/ITECHA.2017.8101907

Chernenkiy, V., Gapanyuk, Y., Nardid, A., Skvortsova, M., Gushcha, A., Fedorenko, Y. and Picking, R. (2017), 'Using the Metagraph Approach for Addressing RDF Knowledge Representation Limitations', in *Proceedings of the 7th IEEE Int. Conference on Internet Technologies and Applications ITA-17*, 12-15 September 2017, Wrexham, UK. doi: 10.1109/ITECHA.2017.8101909

Cooke, A. and Jones, P. (2017), "Criticality Performed: Performative Learning Through Agonistic Interventions", *Provocative Pedagogies: Performative Teaching and Learning in the Arts*, 14 October 2017, University of Lincoln

Cunningham, S. and Suprun, D. (2017), 'Image Matching Principles in Photometrical Transformations', in *Proceedings of the 7th IEEE Int. Conference on Internet Technologies and Applications ITA-17*, 12-15 September 2017, Wrexham, UK. doi: 10.1109/ITECHA.2017.8101915

Cunningham, S., Kanev. (2017), 'Application of Formal Grammar in Text Mining and Construction of an Ontology', in *Proceedings of the 7th IEEE Int. Conference on Internet Technologies and Applications ITA-17*, 1215 September 2017, Wrexham, UK. doi: 10.1109/ITECHA.2017.8101910

Davies, D.G, Bolam, R.C., Vagapov, Y., Excell, P. (2018), 'Ultrasonic sensor for UAV flight navigation', in *Proceedings of the 25th International Workshop on Electric Drives: Optimization in Control of Electric Drives (IWED)*, 31 January – 2 February 2018. Doi: 10.1109/IWED.2018.8321389

Davies, S., Cunningham, S. and Picking, R. (2017) A Comparison of Audio Models for Virtual Reality Video’, in *Proceedings of the IEEE International Conference on Cyberworlds (CW)*, 20-22 Sept 2017, Chester, UK. doi: 10.1109/CW.2017.41

Green, J. (2018), ‘The Basic Social Process of Perceptive Familiarizing: Making a Difference with Scenario Assessment in Executive Education’, *Organisational Learning, Knowledge and Capabilities*, 25-27 April 2018, University of Liverpool, UK.

Green, J. (2018), ‘What’s in it for me? Space Solutions for the Smithereens of Career Management in Education’ *International Conference of the Management & Organizational Behaviour Teaching Society (MOBTS) 2018*, 28-30 June 2018, Maynooth University, County Kildare, Ireland

Hell, M., Bolam, R., Vagapov, Y. and Anuchin, A. (2018), 'Design of a Portable Drone for Educational Purposes', in *Proceedings of the 25th International Workshop on Electric Drives: Optimization in Control of Electric Drives (IWED)*, Moscow, Russia, 31 Jan - 2 Feb 2018, Moscow, Russia. doi: 10.1109/IWED.2018.8321377

Klarmann, S., Manesh, B., Hoenle, T. and Vagapov, Y. (2017), 'Analysis of Insulated-Metal-Substrates Structures in the Context of Heat Dissipation Enhancement', in *Proceedings of the 7th IEEE Int. Conference on Internet Technologies and Applications ITA-17*, 12-15 September 2017, Wrexham, UK. pp.161-164. doi: 10.1109/ITECHA.2017.8101929

Kozhaeva, T., Zhestkov, S., Bulakh, D. and Houlden, N. (2017), 'Programmable Gesture Manipulator for Hand Injuries Rehabilitation', in *Proceedings of the 7th IEEE Int. Conference on Internet Technologies and Applications ITA-17*, 12-15 September 2017, Wrexham, UK. pp.134-136. doi: 10.1109/ITECHA.2017.8101924

Kulik, E., Xuan Trung Tran, Anuchin. A. and Vagapov. Y. (2017), 'GPS-track data processing for the optimisation of the powertrain for hybrid electric vehicles', in *Proceedings of the 58th International Scientific Conference on Power and Electrical Engineering of Riga Technical University*, 12-13 October 2017, Riga, Latvia, pp.1-5. doi: 10.1109/RTUCON.2017.8124845

Lapin, A., Bulakh, D. and Vagapov, Y (2017), 'Event-driven simulation of digital circuits using modified Petri nets algorithm', in *Proceedings of the 7th IEEE Int. Conference on Internet Technologies and Applications ITA-17*, 1215 September 2017, Wrexham, UK, pp.15-17. doi: 10.1109/ITECHA.2017.8101903

Liggett, S. and Jones, M (2018), 'The potential of painting: unlocking Disenfranchised Grief for people living with dementia', in *Proceedings of the 1st European Association for Health Information and Libraries (EAHIL) Conference*, 9-13 July 2018, Cardiff, UK, pp.38. Available at this [website](https://eahilcardiff2018.wordpress.com/).

Madrid-Manrique, M. (2018), 'Living inquiry in higher education: Nomadic interbeing', in *Proceedings of European Congress of Qualitative Inquiry 2018*, Leuven. pp.111-123. Available at this [website](https://kuleuvencongres.be/ECQI2018).

Maier, A., Sharp, A. and Vagapov. Y. (2017), ‘Comparative analysis and practical implementation of the ESP32 microcontroller module for the Internet of Things’, in *Proceedings of the 7th IEEE Int. Conference on Internet Technologies and Applications ITA-17*, 12-15 September 2017, Wrexham, UK. pp.143-148. doi: 10.1109/ITECHA.2017.8101926

Mischok, F., Durieux, O., Vagapov, Y. and Fedyashin, D. (2018), 'Practical Characterisation of the Piezo electric Properties of a 3K T300 Carbon Fibre for Impact Sensoring', in *Proceedings of IEEE International Conference of Russian Young Researchers in Electrical and Electronic Engineering (EIConRus)*, 29 Jan - 1 Feb 2018, Moscow, Russia, pp.1757-1760. doi: 10.1109/EIConRus.2018.8317446

Owens, S. and Cunningham, S. (2017), ‘More Cowbell: Measuring Beat Consistency With Respect To Tempo and Metronome Variations’, in *Proceedings of the 12th International Audio Mostly Conference on Augmented and Participatory Sound and Music Experiences (AM 2017)*, 23-26 August 2017, London, UK. doi: 10.1145/3123514.3123558

Schinagl, P. and Sharp, A. (2017), ‘Algorithmic analysis and hardware implementation of a two-wire-interface communication analyser’, in *Proceedings of the 7th IEEE Int. Conference on Internet Technologies and Applications ITA-17*, 12-15 September 2017, Wrexham, UK., pp.189-193. doi: 10.1109/ITECHA.2017.8101936

Shepley, A (2018), ‘Contouring with a sweeping brush as a catalyst for social engagement and urban renewal’, *Art, Materiality and Representation*, 1-3 June 2018, British Museum, London, UK. Available at this [website](https://www.therai.org.uk/conferences/art-materiality).

Sprake, D., Vagapov, Y., Lupin, S. and Anuchin, A. (2017), 'Housing estate energy storage feasibility for a 2050 scenario', in *Proceedings of the 7th IEEE Int. Conference on Internet Technologies and Applications ITA-17*, 1215 September 2017, Wrexham, UK., pp.137-142. doi: 10.1109/ITECHA.2017.8101925

Stetsenko, I.V., Dyfuchyn, A. and Leshchenko, K. and Davies, J. (2017), 'Web Application for Visual Modeling of Discrete Event Systems', in *Proceedings of the 7th IEEE Int. Conference on Internet Technologies and Applications ITA-17*, 12-15 September 2017, Wrexham, UK. pp.86-91. doi: 10.1109/ITECHA.2017.8101916

Vagapov, Y., Anuchin, A. and Pushchin, M. (2018), 'Modelling of a photovoltaic array using Analog System Lab Kit Pro board', in *Proceedings of IEEE International Conference of Russian Young Researchers in Electrical and Electronic Engineering (EIConRus)*, 29 Jan - 1 Feb 2018, Moscow, Russia, pp. 1791-1794. doi: 10.1109/EIConRus.2018.8317453

Veligorskyi, O., Khomenko, M., Chakirov, R. and Vagapov, Y. (2018), 'Performance Analysis of a Wearable Photovoltaic System', in *Proceedings of IEEE International Conference on Power and Industrial Electronics for Sustainable Energy Systems*, 31 Jan - 2 Feb 2018, Hamilton, New Zealand, pp.376-381. doi: 10.1109/IESES.2018.8349905

Verovko, M., Verovko, O., Kazymyr, V., Davies, J.N. and Bhalla, A. (2017), 'Body Area Networks in a Medical Environment', in *Proceedings of the 7th IEEE Int. Conference on Internet Technologies and Applications ITA-17*, 12-15 September 2017, Wrexham, UK., pp. 92-97. doi: 10.1109/ITECHA.2017.8101917

Weinel, J. and Cunningham, S. ( 2017), ‘Simulating Auditory Hallucinations in a Video Game: Three Prototype Mechanisms’, in *Proceedings of the 12th International Audio Mostly Conference on Augmented and Participatory Sound and Music Experiences*, 23-26 August 2017, London. doi: 10.1145/3123514.3123532

### Exhibitions and Performances

Shepley, A. (2018), ‘You and I are discontinuous beings’, 3-14 May 2018, International Project Space, Birmingham School of Art, Bimingham, UK. Available at this [website](https://www.bcu.ac.uk/news-events/collective-andcollaborative-drawing).

Thompson, E. et al (2016), ‘Imperfect Reverse’, Camberwell Space Projects, London, 18 October - 18 November 2016

### Reports

Lloyd-Jones, N. (2018), ‘Leaving the Armed Forces and Living as a Civilian: An Exploratory Study of Everyday Decision-Making’. Wrexham Glyndŵr University. ISBN: 978-0-46881-85-7. Available at this [website](https://www.fimtrust.org/wp-content/uploads/2018/04/20180306-Veterans-Full-Report-002.pdf).

Madoc-Jones,I., Hughes,C., Dubberley, S., Gorden.C., Washington-Dyer,K., Wilson,F., Ahmed, A., Lockwood,K.,

Wilding, M. (2018) 'Evaluation of homelessness services to adults in the secure estate: Main findings report', 27 June 2018. Welsh Government. ISBN: 978-1-78937-472-8. Available at this [website](https://gov.wales/statistics-andresearch/evaluation-homelessness-services-adults-secure-estate/?lang=en).

## Research Student Completions 2017/18

| **PhD/Professional Doctorate Student** | **Thesis title** |
| --- | --- |
| Carey, H  | The Impact of 'Doing' for People with Motor Neurone Disease: A Case Study Approach  |
| Carter, J  | Close at hand but miles apart? Exploring the relationship between the Digital Universe and the Spiritual Health and Well-Being of Christian Youth  |
| Fairs, L  | An Analysis of Officiating Style within Rugby Union  |
| Kreider, M  | On Time, in Style: Nanosecond Accuracy in Network Control Systems  |
| Monir, S  | High Throughput Process for Atmospheric Pressure Inline Production of Thin Film Photovoltaics  |
| Muir, F  | A narrative enquiry into health visiting practice  |
| Richards, P  | Developing Decision-Making Skills in Elite Sport Teams  |
| Ubrurhe, O  | Energy Optimisation for Mac Protocol in Wireless Body Area Network. Energy Effectiveness in MAC protocol for Wireless Body Area Network  |
| Evans, S | Living with Tuberculosis in North Wales in the 20th Century: Voices from the Sanatorium |
| Hardy, N | Doing time: A qualitative study exploring the time use of adults at-risk of reoffending in England and Wales |
| O'Sullivan, A | 'Forging their Way': An exploration of the socialisation process undergone by trainee teachers during their initial teacher education programme in Wales |

## Research Grants and Contracts active in 2017/18

| **Sponsor** | **Total****Value (£)** | **Project** | **Principal****Investigator** |
| --- | --- | --- | --- |
| ADDACTION (Big Lottery)  | 219,298  | Drink Wise, Age Well  | Prof Iolo Madoc Jones  |
| Barnardo’s  | 56,661  | The ASPIRE project  | Prof Mandy Robbins  |
| BCUHB  | 20,000  | Training and Development in Arts in Health  | Dr Sue Liggett  |
| Change Step (CAIS)  | 7,500  | Change Step Evaluation  | Dr Nikki Lloyd Jones  |
| EPSRC  | 74,640  | High Value Manufacturing Catapult Fellowship: Addressing the industrialisation challenges in rapid microwave and radio frequency processing of polymer matric composites  | Prof Richard Day  |
| EPSRC (University of Sheffield)  | 50,000  | High Value Manufacturing Catapult Fellowship: Research into microwave processing of materials to deliver a scientific understanding and methods for large scale manufacture of composite materials  | Prof Richard Day  |
| NHS Scotland (via Figure 8 Consultancy)  | 33,000  | Evaluation of Minimum Pricing of alcohol in Scotland  | Dr Wulf Livingston  |
| Argyll & Bute Alcohol and Drug Partnership (via Figure 8 Consultancy)  | 2,500  | Understanding the active ingredients of sustained recovery in rural and remote settings  | Dr Wulf Livingston  |
| Welsh Government (via Figure 8 Consultancy)  | 12,000  | Review of Substance Misuse Strategy  | Dr Wulf Livingston  |
| Welsh Government (via Figure 8 Consultancy)  | 1,500  | Analytical Support for the Public Health MUP for Alcohol (Wales)  | Dr Wulf Livingston  |
| North Wales Area Planning Board (via Figure 8 Consultancy)  | 7,500  | Open Access Tier 2 Substance Misuse Review  | Dr Wulf Livingston  |
| Forces in Mind Trust  | 210,859  | Leaving the Armed Forces and Living in Wales  | Dr Nikki Lloyd Jones  |
| Forces in Mind Trust  | 21,681  | Leaving the Armed Forces and living in Wales- Dissemination  | Dr Nikki Lloyd Jones  |
| Mostyn Gallery LTD  | 12,500  | Investigation and identification of Mostyn's existing digital content and the design of a methodology for construction of new platforms  | Prof Alec Shepley  |
| National Deaf Children's Society  | 2,480  | Evaluation of Gearing Up project  | Hayley Douglas  |
| NRN-LCEE (Sêr Cymru)  | 7,700  | Proposal Writing Fellowship (Sally Burr)  | Dr Ian Ratcliffe  |
| USW / RCBC Wales  | 54,555  | RCBC Fellowship  | Helen Carey  |
| Welsh Government  | 69,799  | Evaluation of Homelessness Services provided to Adults leaving the Secure Estate  | Prof Iolo Madoc Jones  |
| Welsh Government  | 20,516  | Review of the Impact of the Youth Work Strategy for Wales 2014-2018  | Jess Achilleos  |
| Wrexham County Borough Council  | 14,500  | Evaluation of Local Government Delivery of Covenant programme  | Dr Nikki Lloyd Jones  |