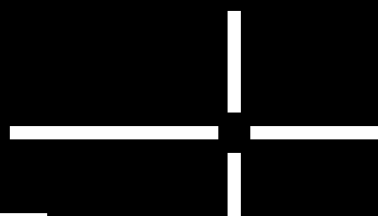
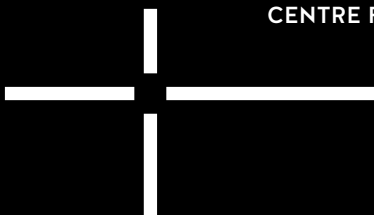


D



CENTRE REPORT 2019

CENTRE FOR RESEARCH IN DIGITAL EDUCATION



E



THE UNIVERSITY of EDINBURGH
Moray House School
of Education

The Centre for Research in Digital Education is based in the Moray House School of Education at the University of Edinburgh. We are interested in how research and practice in education intersects with technology, and the impact of this on culture, policy and pedagogy.

We work with many partner universities as well as policymakers, the cultural heritage sector, schools and other public and private sector organisations.

We take a critical, cross-disciplinary approach to learning, teaching and technology in formal and informal education, and combine our research with world-leading practice in digital education and learning.

BACKGROUND	THE CENTRE	04
	PEOPLE	05
	IMPACT OVERVIEW	10
RESEARCH AND IMPACT	DIGITAL CULTURES	12
	CHILDREN & TECHNOLOGY	18
	DATA SOCIETY	24
TEACHING AND KNOWLEDGE EXCHANGE	TEACHING OVERVIEW	30
	DOCTORAL RESEARCH	31
	SEMINAR PROGRAMME	33
FUNDING	FUNDING OVERVIEW	34
OUTPUTS	PUBLICATIONS	36

EDITORIAL

It has been a great year for us, with some fantastic new colleagues joining the Centre. Ben Williamson was appointed as Chancellor’s Fellow, developing research programmes within the Data Society theme and linking to the Edinburgh Futures Institute, while Michael Gallagher was appointed as lecturer to build research and teaching around distance learning ‘at scale’ and digital education for international development. With the Data Education in Schools work led by Judy Robertson securing funding from the City Region Deal, we have also been joined by Kate Farrell and Tommy Lawson to take forward this important work. And Libby Odai and James Menzies joined us as Research Assistants along with Robyn Pritzker, PhD intern, to work on projects affiliated with Children & Technology.

We have consolidated and built many new connections across the university and beyond, with a few highlights being Lydia Plowman’s appointment as Associate Director in the Scottish Graduate School of Social Science, Judy Robertson taking up a joint Chair between Education and Informatics and Jeremy Knox receiving a Global Academy Fellowship connecting to the Edinburgh Futures Institute.

»The Centre for Research in Digital Education brings together work under three themes: Digital Cultures; Children & Technology; and Data Society. Our work investigates how education is shaping, and is shaped by, technological change.«

The remainder of this report sets out the extent of our activity this year. We have received grants, published widely across many outlets, recruited outstanding new doctoral students, run events engaging hundreds of academics, students and friends to the Centre and travelled the globe to deliver invited talks, keynotes and workshops. We also continue to offer excellent teaching via the MSc in Digital Education and our very popular course on Children and Technology in the MSc Education.

Thanks to all the many colleagues, students, schools, partners, co-researchers and friends who make our work possible!

Siân Bayne
Director, Centre for Research in Digital Education

PEOPLE

The Centre for Research in Digital Education is made up of a core team of academic staff along with a group of international associates who support our work in a variety of ways.

We made important new appointments, but also saw the retiral of **Christine Sinclair** in July 2018, though happily she continues to work with us in her new role as an Honorary Fellow. **Niklas Berliner**, Research Associate, left to take up a role in Informatics, and **Anna Wood** completed the ‘Asking the Right Question’ project though she remains a Centre Associate.

We have been fortunate to have been joined by the following international visiting scholars during 2018–2019:

Dr Yeqin Kang,
Guangdong University of Foreign Studies, China (Aug 2017–Aug 2018)

Professor Nicole Durisch Gauthier
University of Teacher Education, State of Vaud, Switzerland (Jan 2018–Jul 2018)

Mitchell Peters
University of Catalonia, Barcelona (Oct 2018–Dec 2018)

Shana Ferguson
US-UK Fulbright Commission scholar (Jan 2019–Mar 2019)

ACADEMICS



PROFESSOR SIÂN BAYNE
Director of the Centre for Research in Digital Education
Siân’s research is currently focused on higher education futures, interdisciplinary approaches to researching digital education and digital education in the data society.
sian.bayne@ed.ac.uk
sianbayne.net
[@sbayne](https://twitter.com/sbayne)



DR PETER EVANS
Senior Teaching Fellow
Pete’s research interests are in social media and professional and workplace learning.
peter.evans@ed.ac.uk
[@eksploratore](https://twitter.com/eksploratore)



DR RORY EWINS
Lecturer
Rory’s research interests include how we teach and learn about digital citizenship, the implications of intellectual property for digital education, and digital education in developing countries.
rory.ewins@ed.ac.uk
speedysnail.com



DR MICHAEL GALLAGHER
Lecturer
Michael researches digital education in development contexts with a particular focus on educational mobilities, how technology structures and manages these mobilities, and the impact of these movements on local knowledge practices and communities.
Michael.S.Gallagher@ed.ac.uk
Michaelseangallagher.org
[@mseangallagher](https://twitter.com/mseangallagher)

ACADEMICS



DR ZAYBA GHAZALI-MOHAMMED

Research Associate

Zayba is a Research Associate on the Move2Learn research project. Her main research interests include cognitive development of young children's scientific understanding, the role of executive functions and other domain-general capabilities on conceptual progression.
z.ghazali@ed.ac.uk
[@Zayba_G](#)



DR JEREMY KNOX
Centre Co-Director
(Data Society)

Jeremy is a Lecturer in Digital Education and also a Global Academies and Edinburgh Futures Institute Fellow. His current research is focused on AI, machine learning, algorithms and data in higher education. Jeremy also co-convenes the Society for Research in Higher Education (SRHE) Digital University network.
jeremy.knox@ed.ac.uk
jeremyknox.net
[@j_k_knox](#)



DR ANDREW MANCHES
Centre Co-Director
(Children & Technology) and
Co-depute Director of RKE (Impact)

Andrew has led multiple Learning Sciences projects including the UK side of Move2Learn. He researches the role of interaction in how we think and learn, and the implications for early learning. He marries his academic world with industry as CEO of an early learning technology company, Pling Ltd.
a.manches@ed.ac.uk



JAMIE MENZIES
Research Assistant

Jamie is project managing a Wellcome Trust Institutional Translational Partnership Award project that seeks to extend the societal and commercial impact of the Move2Learn project through the design and creation of an exhibit.
jmenzie2@ed.ac.uk



LIBBY ODAI
Research Assistant

Libby is a Research Assistant on the Magic Cloud ESRC-funded Business Booster project. Libby is testing the robustness of the Magic Cloud using different toys and media, capturing and summarising user feedback and considering the future development of Magic Cloud.
v1lodai@ed.ac.uk



CLARA O'SHEA
Associate Lecturer

Clara teaches on the MSc in Digital Education and is working towards a PhD on 'Kinds of learning and kinds of play: an exploration of identity development in formal and informal digital environments'.
Clara.O'Shea@ed.ac.uk
claraoshea.wordpress.com
[@claraoshea](#)

ACADEMICS



PROFESSOR LYDIA PLOWMAN
Chair in Education and Technology

Lydia has more than twenty years' experience of conducting research with children and digital media. She is interested in young children's learning in a range of formal and informal settings, particularly in the ways in which technology is integrated into family life, leisure, work and for educational purposes in the home.
lydia.plowman@ed.ac.uk



PROF. JUDY ROBERTSON
Chair in Digital Learning

Judy has been developing educational technology in collaboration with children and teachers since 1977. She is interested in computer education and serious games for children, particularly game authoring. Her work focuses on how technology can help to solve thorny real world problems.
judy.robertson@ed.ac.uk
[@JudyRobertsonUK](#)



DR JEN ROSS
Centre Co-Director (Digital Cultures)
and Senior Lecturer

Jen is Centre co-director (Digital Cultures), and is involved with the Edinburgh Futures Institute, the Centre for Data, Culture and Society, and the Digital Cultural Heritage Research Network at the University of Edinburgh. She researches and publishes on digital cultural heritage engagement and learning, online and open education, digital futures and speculative methods, and online reflective practices.
jen.ross@ed.ac.uk
[@jar](#)



DR PHILIPPA SHEAIL
Lecturer

Phil is Programme Director for the MSc in Digital Education. Her research interests are interdisciplinary, based in the area of digital and higher education, but drawing on organisational theory, cultural geography, and social theories of time. Phil is currently developing research in the library sector.
p.sheail@ed.ac.uk
[@philshe](#)



DR CLAIRE SOWTON
Project and Communications
Manager

Claire is the Project and Communications Manager for the Centre for Research in Digital Education and Project Manager (UK) for the Move2Learn project. Her recent research has focused on digital and mobile approaches to engagement and evaluation of cultural experience.
claire.sowton@ed.ac.uk
[@_ClaireSowton](#)



DR YI-SHAN TSAI
Research Associate

Yi-Shan currently works on two large multinational research projects on learning analytics (LALA and EMBED). Prior to this, she took the lead on a large learning analytics project investigating the social and cultural factors that influenced institutional adoption of learning analytics. Yi-Shan is also an executive member of the Society for Learning Analytics Research (SoLAR).
yi-shan.tsai@ed.ac.uk
[@yi_shan_tsai](#)

ACADEMICS



DR YUCHEN WANG
Research Associate

Yuchen is currently involved in projects that critically examine the relationships between technology and educational inclusion. Her PhD explored disabled children’s experiences and teachers’ practices in Chinese mainstream schools, following which she was awarded the ESRC Global Challenges Research Fund Post-doctoral Fellowship to build capacity of disability communities, practitioners and policy-makers.

yuchen.wang@ed.ac.uk



DR BEN WILLIAMSON
Chancellor’s Fellow, Centre for Research in Digital Education and the Edinburgh Futures Institute.

Ben’s current research focuses on two key themes. One is the expansion of educational data infrastructures to enable information to be collected from schools and universities, then analysed and circulated to various audiences. The second is the emergence of ‘intimate data’ relating to students’ psychological states, neural activity, and genetic profiles, and the implications for increasingly scientific ways of approaching educational policy and practice.

Ben.Williamson@ed.ac.uk
[@BenPatrickWill](#)

CONSULTANTS



KATE FARRELL
Director of Curriculum Development and Professional Learning (Data Education in Schools)

Kate is developing a data science curriculum for Primary and Secondary schools in Scotland, designing units of work on data handling, trialling these in pilot schools and training teachers to deliver information handling activities.

kate.farrell@ed.ac.uk
[@digitalkatie](#)



TOMMY LAWSON
Schools Technology Advisor (Data Education in Schools)

Tommy works on the Data Driven Innovation programme with a focus on empowering learners through digital solutions. Working between the University and the Education Authority, he is looking at how the Data Education in Schools programme can be delivered within the local and national Digital Learning Strategies.

tommy.lawson@ed.ac.uk
[@_tommylawson](#)



ROBYN PRITZKER
PhD Intern

Robyn works on the Numbuko project focusing on accelerating and capturing the impact of the project, promoting the Numbuko app for teachers and tracking engagement with key research outputs.

r.pritzker@ed.ac.uk

ADMINISTRATION



ANGELA HUNTER
Centre Administrator

Angie organises all aspects of the day-to-day running of the Centre for Research in Digital Education and provides focused support on the City Deal and Move2Learn projects.

angela.hunter@ed.ac.uk

HONORARY SCHOLARS



PROFESSOR JEFF HAYWOOD
Professor Emeritus

Jeff conducts research in the area of digital education policy and strategy, and previously led the Policy research strand of work for the Centre for Research in Digital Education.

thinking.is.ed.ac.uk/jeffhaywood/research-activities



PROFESSOR MARTIN LAWN
Honorary Professor

Martin has researched and published on teacher professionalism and the labour process of teaching. Currently, he researches European education policy and the 20th Century history of the educational sciences and comparative education.



DR HAMISH MACLEOD
Honorary Fellow

Hamish is an Honorary Fellow with research interests in the use of computer-mediated communications and game-informed approaches in teaching and learning. Hamish was a Senior Lecturer with the Centre for Research in Digital Education until his retirement and continues to supervise doctoral students.



PROFESSOR SIR TIM O'SHEA
Professor Emeritus

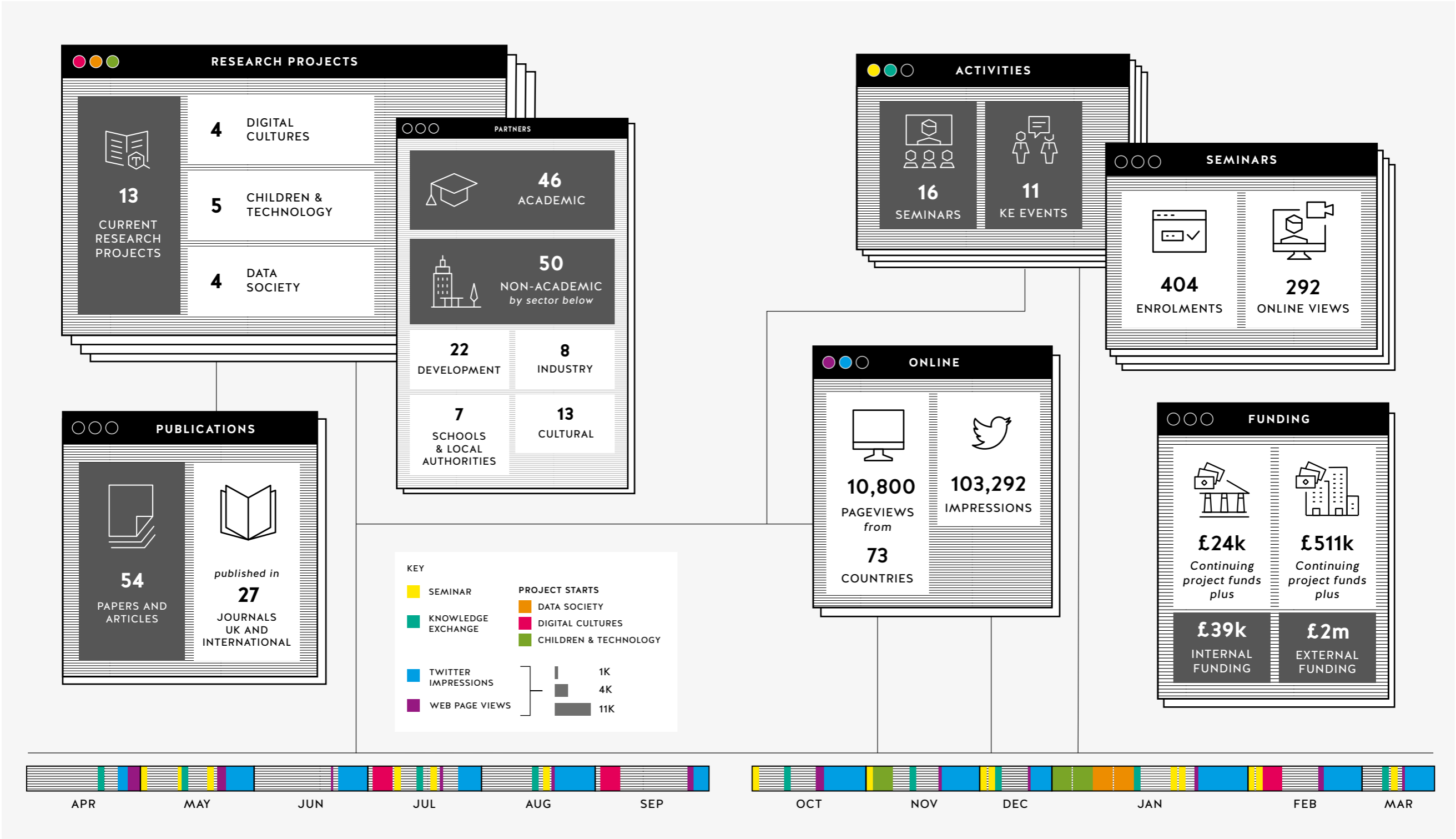
Tim was Principal and Vice-Chancellor of the University of Edinburgh from October 2002 – February 2018. Tim’s academic output is in the area of computer based learning, artificial intelligence, and mathematics education.



DR CHRISTINE SINCLAIR
Honorary Fellow

Christine was programme director on the MSc in Digital Education from 2015 to 2018. She is particularly interested in the changing uses of language and the role of dialogue in digital environments. In addition to writing, she continues to supervise and examine doctoral students and is currently reworking her summer school in academic writing into an open educational resource.

IMPACT OVERVIEW





DIGITAL CULTURES

Education, knowledge, labour, creative industry and heritage systems globally are being re-shaped by digital and data technology. Technologies, in turn, are shaped by the cultural contexts in which they are made and used. Digital Cultures is committed to developing critical perspectives on this from diverse disciplinary perspectives. We are actively researching high impact areas including digital pedagogies and futures, digital cultural heritage, workplace learning and international development and education.

PROJECTS 2018/2019

GCRF Urban Disaster Risk Hub

1 Feb 2019–31 Jan 2024
UKRI Global Challenges Research Fund

Methodological innovations for assessing learning in digital spaces

Jul 2017–Apr 2018
University of Edinburgh and University of Sydney Partnership Collaboration Award

Lecture Recording for Inclusive Education

Jan 2018
UoE Principal's Teaching Award Scheme

Near Future Teaching

2017–2019

CARA

9–12 Sept 2018
Institute for Academic Development,
Council for At-Risk Academics

CONTACT

Dr Jen Ross

Co-Director for Digital Cultures
jen.ross@ed.ac.uk

»Work in the Digital Cultures strand offers crucial insights into how technology and data both influence and are influenced by education in a wide range of contexts – from museums to universities, from workplaces to low-resource community settings.«

DR JEN ROSS

DIGITAL CULTURES IMPACT

Through knowledge exchange activities we promote our research and share findings with students, peers, members of the public and practitioners.

Seminars

Since our last report, we have organised six seminars bringing together international expertise across the work of the Digital Cultures research strand.

DR MICHAEL GALLAGHER, Centre for Research in Digital Education (Edinburgh), presented his research on digital education in **development contexts** outlining the unique challenges associated with the technology, local practices and policy in these regions.

PROFESSOR NICOLE DURISCH GAUTHIER, University of Teacher Education (Vaud, Switzerland) discussed approaches to **active learning** in the context of in-class digital education.

PROFESSOR JOEL SMITH, Carnegie Mellon University (USA), presented research exploring the affordances and challenges of integrating **new educational technologies** into postsecondary education.

Drawing on fanfiction research DR JEN SCOTT CURWOOD (University of Sydney, Australia), DR ALECIA MAGNIFICO (University of New Hampshire, USA) and Associate PROFESSOR JAYNE LAMMERS (University of Rochester, USA) advocated for **transliterations approaches** to addressing the methodological challenges of tracing participation patterns in online writing.

PROFESSOR PETER RULE, University of Stellenbosch (South Africa), applied concerns with the **quality and authenticity**, drawn from Bakhtin and Gadamer to the implications for teaching and learning in the digital age.

DR IBRAR BHATT and DR ALISON MACKENZIE, Queens University Belfast, considered **digital literacy** in the context of the philosophical study of ignorance.

Knowledge Exchange Events

In addition to our seminar programme our academics have delivered knowledge exchange activities engaging researchers, practitioners and members of the public. Building on our involvement in the 2017 ESRC Festival of Social Science, Yi-Shan Tsai produced the video, **‘Vox pops on robots’**, featuring young participants discussing their thoughts on teacher automation. Dr Jen Ross, Dr Michael Gallagher and Dr Hamish Macleod travelled to Istanbul to lead a **three-day workshop for the Council for At-Risk Academics (CARA)** – see case study p15.

Presentations

We have shared our research through 14 presentations (keynotes, invited talks, papers and posters) in the UK and 13 presentations internationally (Australia, Croatia, Canada, Germany, New Zealand, Turkey, USA).

- AU: Jen Ross gave an invited talk at the Centre for Research in Learning and Innovation, **University of Sydney**
- DE: Siân Bayne gave an invited talk at **Jacobs University**, Bremen, and Jen Ross gave an invited talk at the **University of Göttingen**
- NZ: Siân Bayne gave a keynote speech at the **Flexible Learning Association of New Zealand annual conference**
- TR: Jen Ross, Michael Gallagher and Hamish Macleod were invited to Istanbul to deliver a workshop with the **Council for At-Risk Academics**
- US: Siân Bayne gave a talk as part of the **Edinburgh University Global Change Forum** at the Tata Innovation Centre, Roosevelt Island, New York City
- UK: Within the UK, we gave invited talks at the **Universities of Bristol, Cambridge, Glasgow, and Edinburgh**.
- HR: We also presented at conferences online and in Croatia with Jen Ross, Michael Gallagher, Hamish Macleod, Clara O’Shea and Christine Sinclair all presenting at the **Networked Learning Conference** in Zagreb.

Council for At-Risk Academics (CARA)

What was the project?

In early September 2018, members of the Digital Education research centre travelled to Istanbul to lead a three-day workshop on online teaching for a group of academics displaced to Turkey by the Syria crisis. The Digital Education team designed a workshop that blended practical, hands-on activities with sessions on online pedagogies, knowing your students, and considering the potential of digital spaces. The final afternoon of the workshop was given over to presentations and discussions of the materials everyone had created. Beyond the workshop, Michael Gallagher has continued to work closely with CARA, leading webinars and considering next steps for this digital education activity.

Who did you work with?

Dr Jon Turner, Director of the Institute for Academic Development (University of Edinburgh) invited researchers from the Centre to lead the development and delivery of the workshop.

What was the impact?

The three-day workshop reached 50 Syrian academics currently based in Turkey. Participant feedback recognised the intention to utilise new skills, share practice and consider the broader pedagogical advantages of digital education.

»I’m going to use skills I’ve learned in this course to teach students within my teaching specialty. I will inform my future colleagues about this method including creating teaching videos.« Participant Feedback

Why is it important?

Founded in the 1930s, CARA now works with over 100 universities in the UK, supporting academics, postdoctoral researchers and doctoral students in immediate danger as a result of persecution, conflict or violence. CARA support includes practical and financial help as well as networking and training opportunities for exiled academics aiming to return home to rebuild their societies.



CARA Workshop in Istanbul, September 2018

Support like this workshop, which helps academics to continue to work with their colleagues and students, both those based in Syria and others who may have moved or been displaced, is a vital part of such networking and helps develop new possibilities for education and collaboration at a distance.

»Acquired skills will enable me to do online education in a professional way and teach refugee students from different nationalities. It will be of more use compared to face-to-face education.« Participant Feedback

PROJECT DETAILS			
PRINCIPAL INVESTIGATOR: Dr Jon Turner (Institute for Academic Development)	TEAM: Dr Jen Ross Dr Michael Gallagher Dr Hamish Macleod		
	DIY Film School, University of Edinburgh		
FUNDER: Institute for Academic Development, Council for At-Risk Academics	PROJECT DATES: 9-12 Sep 2018		
	WEBSITE: www.cara.ngo www.global.ed.ac.uk/features/refugee-support-university-edinburgh		

GCRF – Urban Disaster Relief Hub

Rapid urbanisation presents a time-limited global opportunity to embed disaster risk management in urban development. The GCRF Urban Disaster Risk Hub will work across 12 partner countries and 54 partner organisations to bring disaster risk management to the centre of global urban policy and practice, strengthening the voice and capacity of the urban poor.

Digital Education will contribute to the project by advising on educational approaches to disaster risk reduction. Our involvement in this project builds on our previous work in emergency contexts including REAR: Research for Emergency Aftershock Response.

PROJECT DETAILS			
PRINCIPAL INVESTIGATOR:		PROJECT DATES:	
Professor John McCloskey, School of Geosciences		1 Feb 2019– 31 Jan 2024	
TEAM:		AWARD:	
Co-I Professor Siân Bayne		£40,552 (total grant value: £19.6M)	
FUNDER:			
UKRI Global Challenges Research Fund			

Unlike a Version: the lives of digitised artworks

Digitised artworks are more than merely versions of the 'real thing': they have meaning and value in their own right, and significance for sharing, interpretation, connection and inspiration. This doctoral project will develop a richer picture of digital objects and how they contribute to the shifting boundaries of the institution, to curatorial practice, and to the National Galleries of Scotland ambition to open more of its collections to digital re-use.

PROJECT DETAILS			
PROJECT LEAD:		FUNDER:	
Dr Jen Ross		AHRC Collaborative Doctoral Partnership	
TEAM:		PROJECT DATES:	
Professor Melissa Terras Christopher Ganley and Mairi Lafferty (National Galleries of Scotland)		Oct 2019– Sep 2022	



Unlike a Version will explore the sharing and interpretation of digitised artworks, like 'The Madonna of the Annunciation' by Francesco Allegrini

© The Madonna of the Annunciation. Francesco Allegrini. National Galleries of Scotland

PUBLICATIONS



Ross J, Knox J, Sowton C, Speed C. 2019
Mobilising connections with art: Artcasting and the digital articulation of visitor engagement with cultural heritage
International Journal of Heritage Studies 25(4), pp. 395-414.

This article looks at how digital methods in cultural heritage settings can help evoke and illuminate the richness of visitor engagement and interpretation and ultimately contribute to our understanding of how heritage is performed at an individual and a collective level.

DOI: 10.1080/13527258.2018.1493698.



Bayne, S, Connelly, L, Osborne, N, Tobin, R, Grover, C, Beswick, E & Rouhani, L 2019,
The social value of anonymity on campus: A study of the decline of Yik Yak
Learning, Media and Technology. Online first.

This paper tries to understand what students and academic communities stand to lose when data surveillance is normalised online: it uses findings from an empirical research project to argue that we need pro-programmes of work in universities which are sensitive to the social value of anonymity on campus.

DOI: 10.1080/17439884.2019.1583672

Sheail, P 2018,
Temporal flexibility in the digital university: Full-time, part-time, flexitime
Distance Education 39(4), pp. 462-479.

This research highlights the importance of paying attention to temporal aspects of organisational change, with particular reference to the development of part-time online distance education in a higher education context.

DOI: 10.1080/01587919.2018.1520039

Gallagher, M 2018,
Amira's complexity and cosmopolitanism: the role of disposition in mobilities and mobile learning.
In M Bajic, T Ryberg, P Jandrić, M de Laat & NB Dohn (eds), Proceedings of the 11th International Conference on Networked Learning 2018, 14th–16th May 2018. Zagreb, Croatia. 11th International Conference on Networked Learning 2018, pp. 189-196.

This paper positions learning in the diaspora of international education: across multiple interactional contexts, amongst people and interactive technologies, encapsulating public and private processes.

Available at: http://networkedlearningconference.org.uk/abstracts/papers/gallagher_18.pdf

HIGHLIGHT

Near Future Teaching
The Near Future Teaching project advocated for university staff and students building a preferred future for teaching based on shared values, rather than on anticipated technological change. The final report and all materials are now available for re-use on our website: nearfutureteaching.ed.ac.uk



400
STUDENTS
AND STAFF



50
INTERVIEWS



15
EVENTS



© Flickr: DejanKrismanovic (Creative Commons)

CHILDREN & TECHNOLOGY

Digital technology increasingly shapes the way young people live and learn. The outcomes of our research will:

- + contribute to discussions about technology in young children's lives
- + create richer learning experiences by informing the design process
- + provide valuable insights and support for parents and teachers
- + engage decision-makers in the role of technology in children's lives

PROJECTS 2018/2019

Move2Learn: Embodied learning for pre-school scientists

2017–2020
Wellcome Trust

Magic Cloud

Jan–Jul 2019
ESRC Business Booster

Co-Creation of an embodied learning technology for early science

Jan–Dec 2019
Wellcome Trust

Numbuko

Nov 2018–Feb 2019
University of Edinburgh College of Arts Humanities and Social Sciences Knowledge Exchange & Impact grant

Internet of Things platform for early learning soft toys

Mar–Jul 2018
University of Edinburgh Launch.ed Enterprise Initiative Grant

Data Education in Schools

Apr 2019–Mar 2027
Integrated Regional Employability and Skills programme (Edinburgh) and South East Scotland City Region Deal

CONTACT

Dr Andrew Manches

Co-Director for
Children & Technology
a.manches@ed.ac.uk

»We believe that a better understanding of how children interact with technology not only helps us understand its influence, but also helps inform our role, in both supporting children's interactions and informing the design of new technologies.«

DR ANDREW MANCHES

CHILDREN & TECHNOLOGY IMPACT

Our work seeks to maximise the positive impact of our research into children’s interaction with technology, both directly with children or indirectly through a range of key stakeholders (edtech industry, teachers and parents).

Seminars

Since our 2018 report, we have organised four seminars bringing together expertise across the work of the Children and Technology research strand.

DR ZAYBA GHAZALI-MOHAMMED, Centre for Research in Digital Education, discussed new approaches to assessing **conceptual progression in science** in the early years.

Our Digital Learning in Schools event brought together three speakers to share their research and experience teaching **data literacy** to young people. KATE FARRELL and TOMMY LAWSON, Centre for Research in Digital Education, focused on **data handling** and presented an update on Newbattle Digital Centre of Excellence. DR HAMISH TODD, University of Edinburgh, examined user interaction with **scientific simulations** in online interactions.

PROFESSOR SHAARON AINSWORTH, University of Nottingham, presented research on the use of **drawing in assessment, learning and teaching** in primary, secondary and tertiary medical education.

DR SUMIN ZHAO explored the role mobile technologies play in the **literacy practices of young children** from immigrant and expatriate families.

Knowledge Exchange Events

In addition to our seminars we have organised and participated in a range of knowledge exchange opportunities reaching a broad audience.

A resource for teaching computing education aspects of the Technologies curriculum of Curriculum for Excellence was delivered to all primary schools in Scotland (funded by Education Scotland, Skills Development Scotland, SICSA Education and the Royal Society of Edinburgh). **Teach Computing Science** can also be accessed online at www.teachcs.scot.

The Move2Learn project team participated in the STEM for All Video Showcase, a competition open to projects

in receipt of National Science Foundation funding. Their video was one of 12 (out of 214) to win a Presenter Choice Award. Andrew Manches and Zayba Ghazali-Mohammed participated in Science Lates, an after hours event run by Glasgow Science Centre. Their version of ‘Science Charades’ invited teams of adults to communicate science concepts using gesture. The Move2Learn team (supported by students from our doctoral and MSc programmes) also took the Science Charades concept to Teeny Tiny Toddler Fest at Camera Obscura & World of Illusions in Edinburgh.

As part of Computer Science Education Week, Judy Robertson organised a series of workshops to support teachers designing projects using technology to solve societal problems, try Scratch programming and create animations.



Workshop with Braidburn School Pupils

Kate Farrell worked with Braidburn school pupils to design and test floating nets powered by Sphero robots to help reduce plastic pollution in our oceans. She is also working with Newbattle Digital Centre of Excellence on a digital literacy curriculum, and a project about health and fitness data (in conjunction with Sam Fawcner and Stephanie Adams).

In September 2018, Professor Lydia Plowman became an Associate Director (Interdisciplinarity and Advanced Training) for the Scottish Graduate School of Social Science, an international adviser for the Early Childhood

Australia Statement on young children and digital technologies (2018) and an adviser to NHS Scotland Redesigning Health Information for Parents (ReHIP) team on content relating to screen time in the Ready Steady Baby materials distributed to all new parents in Scotland (2018).

Awards

Andrew Manches was nominated for the Tam Dalyell prize for Excellence in Engaging the Public with Science 2018 – 19.

Presentations

Our academics have shared their research through 13 presentations (keynotes, invited talks, workshops, roundtables, papers and posters) in the UK and 11 presentations internationally (Austria, Australia, Cyprus, Germany, Hong Kong, South Africa, USA).

- AU: Lydia Plowman gave an invited talk at the National forum on multimodal learning for young children, held at **La Trobe University** in Melbourne.
- CY: Judy Robertson gave a keynote lecture at **ACM Innovation and Technology in Computer Science Education** in Larnaca.
- DE: Andrew Manches gave a keynote at the **EARLI SIG 5 ‘Future Challenges for Early Childhood Education & Care’ conference** in Berlin and was an invited member of the ‘Critical discussion of the role of technology in early childhood’ panel. Judy Robertson gave a keynote for the 13th Workshop in Primary and Secondary Computing Education in October 2018 in Potsdam.
- HK: Judy Robertson gave an invited talk at a conference on computational thinking for children in Hong Kong.
- US: Lydia Plowman gave a keynote lecture at the **Erikson Institute** in Chicago and was a discussant for the symposium on Young children learning with mobile devices: Research on design and implementation at the **American Educational Research Association conference** in New York.
- UK: Within the UK, we gave invited talks at the **University of Edinburgh, University College London**, with the **UK Association of Science and Discovery Centres** and the **Royal Society of Edinburgh**.

Data Education in Schools

What was the project?

We will develop an interdisciplinary data education curriculum, mapped closely to existing maths and computing curriculum topics, as well as a set of engaging, real world data science teaching materials for teachers. We will start and support professional learning for local teachers to support them to teach the new material and educate young people and their parents about career opportunities relating to data.

Who did you work with?

We are working with Edinburgh, Midlothian, East Lothian, West Lothian, Fife and Borders local authorities, as well as the local further education colleges, Edinburgh Napier and Heriot Watt universities and local employers to offer opportunities to learners at all stages over the next 8 years.

What was the impact?

Every learner will have the opportunity to learn about how their personal data is used, their legal rights and privacy implications. They should be able to identify what data is collected about them and where it is stored, be aware of and able to make use of open data, and be able to contribute to the ongoing discussion and evolving definition of data citizenship. The project has the potential to improve so many children’s learning and future opportunities.

Why is it important?

The Data Education in Schools project is part of a wider programme to develop data driven innovation within the region, with the ambition of making Edinburgh the data capital of Europe. This can only happen with a highly skilled workforce, which this project contributes to.

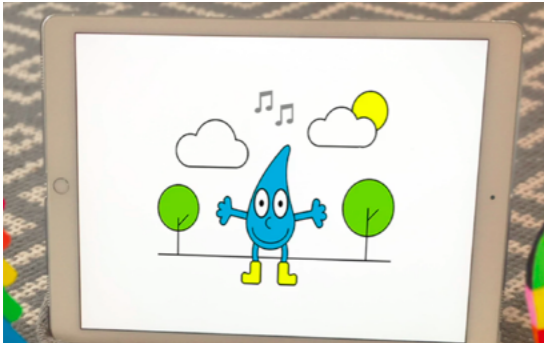
PROJECT DETAILS

PRINCIPAL INVESTIGATOR: Professor Judy Robertson	AWARD: £2.4M
TEAM: Kate Farrell and Tommy Lawson	PROJECT DATES: 1 Apr 2019–31 Mar 2027
FUNDER: Integrated Regional Employability and Skills programme (Edinburgh) and South East Scotland City Region Deal	



Magic Cloud

Informed by research in the Children and Technology group, the Magic Cloud is an Internet of Things platform that wirelessly links soft toys to digital content in order to support early learning. The Magic Cloud supports children’s learning through play, song and guided interaction from parents. This project works with educational organisations to explore ways that the Magic Cloud can extend the learning experiences they offer through soft toys they already sell.



PROJECT DETAILS

PRINCIPAL INVESTIGATOR:
Dr Andrew Manches

TEAM:
Libby Odai

FUNDER:
ESRC Business Booster

WEBSITE:
de.ed.ac.uk/project/magic-cloud-esrc-business-booster

PROJECT DATES:
**13 Jan 2019–
14 Jul 2019**

AWARD:
£10,000



© Alfonso Juárez

Co-Creation of an embodied learning technology for early science

This project will extend the societal and potential commercial impact of the Move2Learn project through proof of concept development of a digital ‘embodied learning’ exhibit with our partners at Glasgow Science Centre (GSC). We will design an external prototype exhibit that can be used and evaluated with children and parents in science centres.

PROJECT DETAILS

PRINCIPAL INVESTIGATOR:
Dr Andrew Manches

TEAM:
Dr Zayba Ghazali-Mohammed
(Co-Investigator)
Jamie Menzies
(Research Assistant)

PROJECT DATES:
**1 Jan 2019–
31 Dec 2019**

AWARD:
£19,519

FUNDER:
Wellcome Trust Translational Partnership Award

PUBLICATIONS



Manches, A, McKenna, P, Rajendran, G & Robertson, J 2019,
Identifying embodied metaphors for computing education

Computers in Human Behavior
This paper brings together computing education and embodiment theory for the first time opening up a new line of research enquiry as well as significant pedagogy and design implications.
DOI: 10.1016/j.chb.2018.12.037



Robertson J, Macvean A, Fawcner S, Baker G, Jepson R 2018.
Savouring our mistakes: Learning from the FitQuest project

International Journal of Child-Computer Interaction. 16, pp. 55-67.
This paper is a synthesis of 5 years of empirical research and a reflection on methodologies for designing for and with children using interdisciplinary collaboration.
DOI: 10.1016/j.ijcci.2017.12.003



Marsh, J, Plowman, L, Yamada-Rice, D, Bishop, J, Lahmar, J & Scott, F 2018,
Play and creativity in young children’s use of apps

British Journal of Educational Technology, 49(5), pp. 870-882.
Funded by an ESRC Knowledge Exchange grant, this study, based on a survey of 2000 parents and six case studies, is the first to systematically investigate the extent to which apps for children aged 0–5 foster play and creativity.
DOI: 10.1111/bjet.12622

HIGHLIGHT

Data Education in Schools

The ambitious Data Education in Schools project will support all school learners in the region to become data citizens and understand the role of data across society. It will seek to improve children’s learning, teachers’ knowledge and skills, contributing to data driven innovation and Edinburgh’s aspiration to become the data capital of Europe.



113,000
PUPILS



8
YEARS



550
SCHOOLS



DATA SOCIETY

This theme is concerned with innovative interdisciplinary studies of data-processing technologies and data-intensive socio-technical systems, with a particular focus on developing educational perspectives that can enhance the technical, sociological, political, and ethical understanding of the contemporary 'data society'. Key directions for research involve examining the relationships between technical areas such as artificial intelligence (AI), machine learning, algorithms, and 'big data', and educational issues such as curricular and policy development, classroom practices, educational theory, the learning sciences, and education technology development.

PROJECTS 2018/2019

Supporting Higher Education to Integrate Learning Analytics

Jan 2015–Jun 2018

SHEILA, European Commission

Data Bodies in the library

Aug 2017–Jul 2018

University of Edinburgh, College of Arts Humanities and Social Sciences
Challenge Investment Fund

Ethics and Justice for Data and Artificial Intelligence

Jan 2019–Dec 2019

Global Academy & Edinburgh Futures Institute

Hacking Distance Learning

Jan 2019

University of Edinburgh Student Experience Grant

CONTACT

Dr Jeremy Knox

Co-Director for Data Society
jeremy.knox@ed.ac.uk

»Data society responds to the increasingly important issues raised by the collection and processing of digital data in education, and will develop a critical research agenda around analytics, 'big data', algorithms, machine learning, and other data-intensive practices.«

DR JEREMY KNOX

DATA SOCIETY IMPACT

Our research examines the relationships between technical areas such as artificial intelligence and ‘big data’, and educational issues including curricular development, educational theory and classroom practice.

Seminars

Since our last report, we have organised six seminars bringing together expertise across the work of the Data Society research strand.

DR LINA DENCİK, University of Cardiff, with DR CALLUM MCGREGOR and DR GARY FRASER, University of Edinburgh, presented as part of the third event in our Data Citizenship series. Lina focused on the use of ‘data scores’ in **public services** within the UK and Callum questioned the dominant narrative of data citizenship and its **consequences for communities**. Gary presented his research exploring how the **transformative effects of digital technologies** are manifested in community education.

DR GREG MICHAELSON, Heriot-Watt University, examined the roots of Data Science and simple machine learning techniques, the **problems of Big Data** and the gap between computational and human intelligent problem solving.

DR BEN WILLIAMSON, University of Edinburgh, reviewed the **expansion of a data infrastructure** for the collection, analysis and diffusion of student data in UK higher education institutions.

DR PETAR JANDRIĆ, University of Applied Sciences, Croatia, discussed the development of the **postdigital** concept and associated challenges in science and education. MITCHELL PETERS (visiting scholar), University of Catalonia, Spain, described a **digital learning ecologies** framework to examine the ways students orchestrate their learning ecology in order to generate opportunities for learning across formal and informal contexts.

DR KOBI GAL, University of Edinburgh, discussed computational methods to support students in their learning and identified research problems within this context as well as some initial solutions from **artificial intelligence, HCI and data mining**.

DR REBECCA EYNON, University of Oxford, presented research on **artificial intelligence and lifelong learning** and exploring the social and educational implications of a fragmented landscape.

Presentations

Beyond our own seminar programme our academics have shared their research through 17 presentations (key-notes, invited talks, workshops, roundtables, papers and posters) in the UK and 11 presentations internationally (Australia, China, Croatia, Finland, Germany, Netherlands, Sweden, USA).

- AU: Yi-Shan Tsai gave a series of invited talks on learning analytics at the **University of Sydney**
- CN: Jeremy Knox gave an invited talk on open learning at **Beijing Normal University**
- FI: Yi-Shan Tsai gave an invited talk and delivered a workshop in Helsinki
- DE: Ben Williamson gave a keynote lecture at **OEB Global** in Berlin
- SE: Ben Williamson gave a keynote talk on ‘intimate data’ at **Malmo University**
- UK: Within the UK, we gave invited talks at the **Universities of Cambridge, Birmingham, Belfast, Leeds, De Montfort** and **Edinburgh** as well as at the **British Sociological Association** and the **Scottish Graduate School of Social Science**.

We also presented at conferences online and in Maastricht, Sydney, Arizona, Zagreb.

Awards

Yi-Shan Tsai was nominated for a Best Paper Award and received a Best Poster Award at the 8th International Learning Analytics and Knowledge conference in Sydney in 2018 and has been elected as one of the member-at-large of the Society for Learning Analytics Research (SoLAR) Executive: solaresearch.org.

Supporting Higher Education to Integrate Learning Analytics (SHEILA)

What was the project?

The SHEILA project assists European higher education institutions to become more mature users and custodians of digital data collected from students during their online learning activities.

A series of research activities took place between January 2016 and September 2018 to investigate the state of the art in terms of learning analytics (LA) adoption in Europe, drivers for adoption, challenges, and successes to date. The project then built a policy development framework (SHEILA framework) to support systematic, sustainable and responsible adoption of LA at an institutional level. The study concluded with a recommendation of a dialogical approach to dealing with the social and cultural challenges associated with LA, so as to move towards systematic adoption under a shared vision across the institution.

The SHEILA project team has organised and participated in a range of conferences, consortiums, and workshops during the last year: sheilaproject.eu/events

Who did you work with?

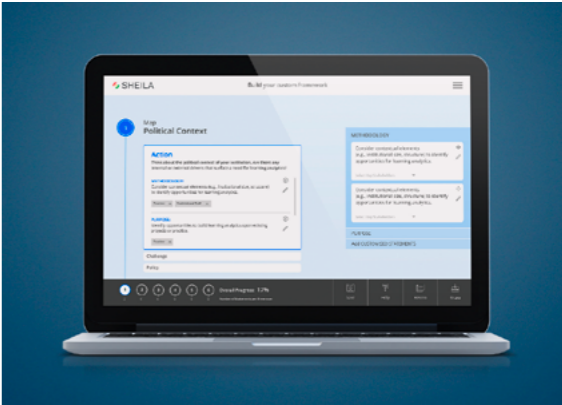
SHEILA was funded by the European Commission via the Erasmus+ program. The SHEILA team includes institutional leaders, LA experts and teaching staff from Brussels Educational Services, Open University of the Netherlands, Tallinn University, Universidad Carlos III de Madrid, European Association for Quality Assurance in Higher Education and the Erasmus Student Network, and includes associate partners from 58 organisations across 23 countries.

What was the impact?

The SHEILA framework offers good reference points for institutions to develop or review their strategy and policy for LA and assess their institutional readiness. The impacts and sustainability of the project are evident in another Erasmus+ project – LALA(<https://www.lalaproject.org/>), which adapts the SHEILA framework to the Latin American higher educational context. The web tool of the framework together with other materials produced by the SHEILA project have been made openly accessible at: <https://sheilaproject.eu/>

Why is it important?

The use of learning analytics has gained increasing attention in recent years. At the same time, few higher education institutions in Europe and the world are ‘student data informed’. The SHEILA programme addresses this gap through the development of a long term learning analytics policy agenda and a community among higher education institutions across Europe.



Top: Sheila Framework, Bottom: Sheila Framework Webtool

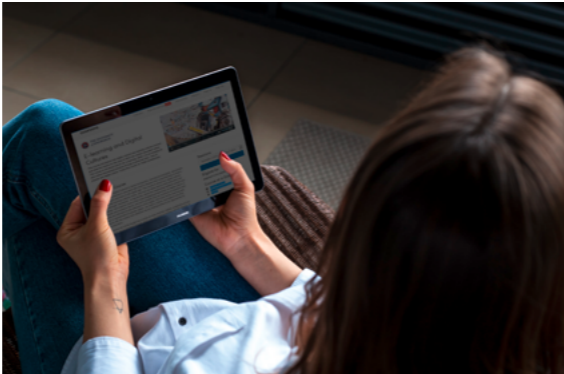
PROJECT DETAILS			
PRINCIPAL INVESTIGATOR:	Professor Dragan Gašević	PROJECT DATES:	1 Jan 2015–30 Jun 2018
RESEARCH ASSOCIATE:	Dr Yi-Shan Tsai	AWARD:	£136,857
FUNDER:	European Commission	Total grant value:	£460,612

Ethics and Justice for Data and Artificial Intelligence

The University of Edinburgh is currently involved in a number of large-scale projects that are grounded in the idea of using data-driven technologies to solve local and global challenges. There is a pressing need to enhance the critical capacity of these initiatives by giving due attention to the technologies themselves, and asking challenging questions about how data are used, and what kind of agency stakeholders have in the process.

As a Global Academy and Edinburgh Futures Institute Fellow, Dr Jeremy Knox will be working across the College of Arts, Humanities and Social Sciences to build awareness and understanding of the social and ethical implications of our increasingly 'datafied' institution.

PROJECT DETAILS		
PRINCIPAL INVESTIGATOR:	PROJECT DATES:	
Dr Jeremy Knox	1 Jan 2019–31 Dec 2019	
FUNDER:	AWARD:	
Global Academy & Edinburgh Futures Institute	£5000	



Hacking Distance Learning

The central aim of the hackathons project is to co-produce, with student participants leading the session, technologies that bring distant students and those on the campus together as one community. This project will directly benefit 'hackathons' attendees through a multi-disciplinary and collaborative event that brings together undergraduate, postgraduate, and research students to co-design the future university. Participants will be invited with a range of skills, including technical coding and 'making' expertise, as well as social, cultural and ethical perspectives, promoting the sharing of values and abilities.

PROJECT DETAILS		
PRINCIPAL INVESTIGATOR:	PROJECT DATES:	
Dr Jeremy Knox	1 Jan 2019	
TEAM:	AWARD:	
Dr Michael Gallagher James Lamb	£1,908	
FUNDER:		
Student Experience Grant		

PUBLICATIONS



Knox, J 2018,
**Beyond the ‘c’ and the ‘x’:
learning with algorithms
in the MOOC**
International Review of Education,
64(2), pp. 161-178
Education is becoming embroiled in an “algorithmic culture” that defines educational roles, forecasts attainment, and influences pedagogy. This article identifies and examines four key areas where algorithms influence the activities of the MOOC: (1) data capture and discrimination; (2) calculated learners; (3) feedback and entanglement; and (4) learning with algorithms.
DOI: 10.1007/s11159-018-9707-0

Williamson, B 2018,
**The hidden architecture of
higher education: building
a big data infrastructure for
the ‘smarter university’**
*International Journal of Educational
Technology in Higher Education*, 15(12)
‘The hidden architecture of higher education’ presents a detailed study of the new data infrastructure to capture and process student information in UK HE, demonstrating how governmental processes of HE marketization are the product of cross-sector policy networks and platform software.
DOI: 10.1186/s41239-018-0094-1



Tsai, Y-S, Moreno-Marcos, PM, Jivet, I, Scheffel, M, Tammets, K, Kollom, K & Gasevic, D 2018,
**The SHEILA framework:
informing institutional strate-
gies and policy processes
of learning analytics**
Journal of Learning Analytics, 5(3), pp. 5-20.
This paper presents the scientific inquiries undertaken to develop the SHEILA framework and four case studies demonstrating how the frame- work can be used to assist with learn- ing analytics policy and strategy formation in addition to institutional readiness assessment.
DOI: 10.18608/jla.2018.53.2

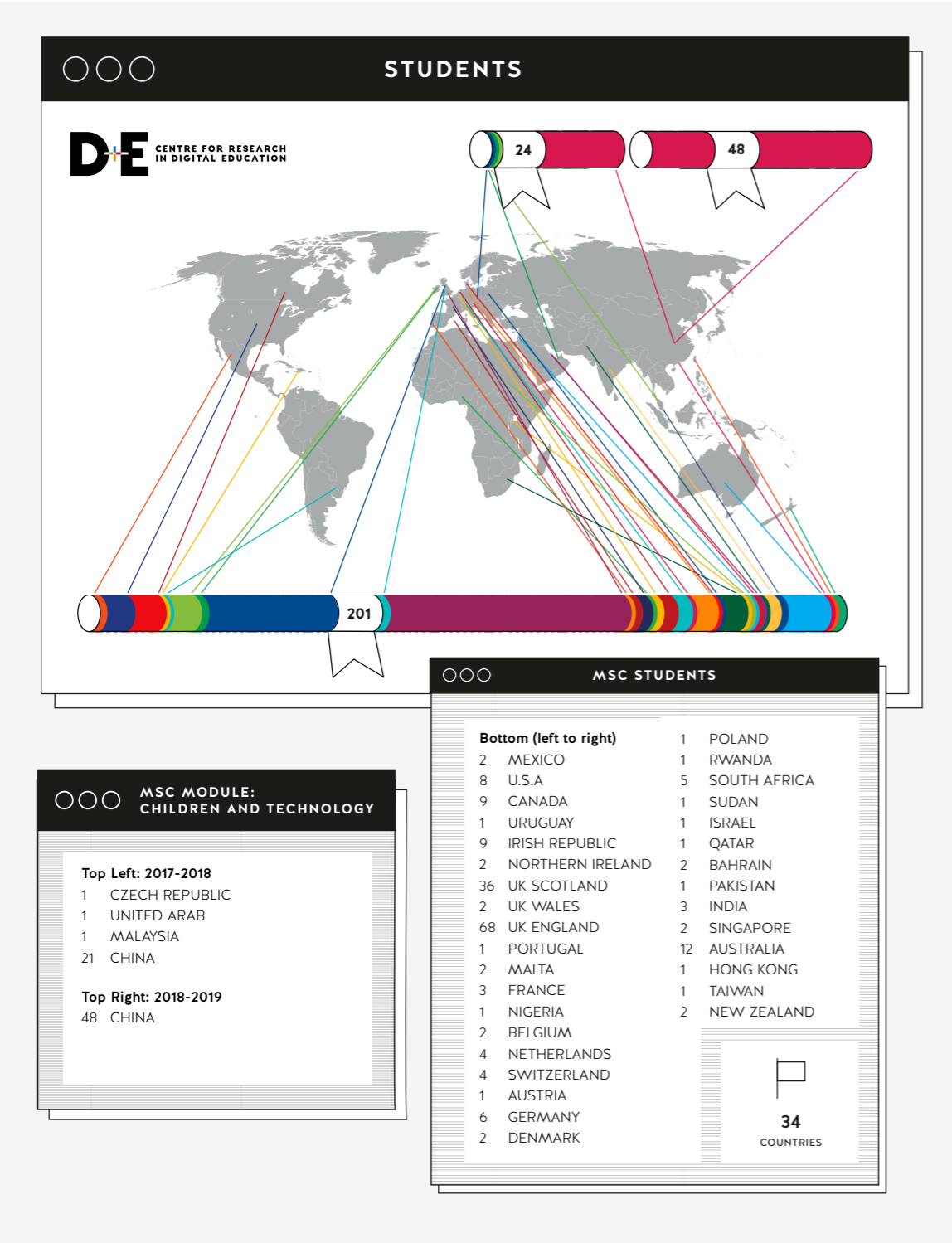
HIGHLIGHT

**DATA & TECHNOLOGY
ETHICS INQUIRY
(EDUCATION)**
Dr Ben Williamson was an invited participant of the ‘Data and Technology Ethics Inquiry (Education) roundtable’, an All Party Parliamentary Group event leading to a Parlia- mentary report.

The ‘Data and Technology Ethics’ report, which has been sponsored by Deloitte and Jisc, brings together policy recom- mendations on the use of big and open data in education, healthcare, autonomous vehicles, and policing.

The report will be laun- ched in the UK Parliament in May 2019 by Minister of State for Digital, Margot James MP.

TEACHING OVERVIEW



DOCTORAL STUDENTS

Nine doctoral students have graduated since the Centre for Research in Digital Education was formed in November 2015. 21 doctoral students are currently associated with the Centre:

STUART ALLAN
The roles and purposes of organisational narratives in mediating, activating and resisting educational change.
Supervisors: Dr Jen Ross and Professor Siân Bayne

NADA ALSAYEGH
The Cultural Implications of Arabic Massive Open Online Courses in the Middle East.
Supervisors: Dr Jen Ross and Dr Jeremy Knox

ATHARY ALMUHANNA
The effects of the flipped classroom model on the learning environment.
Supervisors: Dr Christine Sinclair and Prof Jeff Haywood

VALENTIA ANDRIES
Promoting play in a children's hospital: a person-centred approach to technology design with families.
Supervisors: Prof Judy Robertson and Prof Lydia Plowman

SHARON BOYD
Student-community engagement activities at distance – digital narrative methods to capture a sense of 'place' in research.
Supervisors: Dr Jen Ross and Dr Beth Christie

MURRAY CRAIG
Technology-related attitudes, beliefs and practices of secondary school physical education teachers in Scotland.
Supervisors: Dr Christine Nash and Dr Jen Ross

NOREEN DUNNETT
Re-imagining disengagement from learning: the sociomaterial practices of classrooms and digital game spaces.
Supervisors: Prof Siân Bayne and Dr Hamish Macleod

MAUREEN FINN
Experience edited: mobile pupils and the material environment of the school.
Supervisors: Prof Lydia Plowman and Dr Jen Ross

CHRIS HAMBLEY
Sociomaterial reading of learning spaces, specifically how people negotiate power in the context of transforming an ICT learning centre, and how users experience this space because of its design patterns.
Supervisors: Professor Siân Bayne and Dr Christine Sinclair

ANA HIBERT
The use of Automated Writing Evaluation (AWE) technologies as a support tool for students of English as a second language.
Supervisors: Professor Dragan Gašević (Monash University) and Seongsok Choi

NICOLA KIERNAN
Use of technology in STEM Education and learning progressions (Chemistry).
Supervisors: Dr Andrew Manches and Dr Michael Seery (School of Chemistry)

XIN LUO
Using WeChat to explore parents' perspectives on early years education in China.
Prof Lydia Plowman and Dr Shari Sabeti

JOHN MORRISON
Understanding the real and perceived barriers for participation in higher education among care experienced individuals. Exploring what value digital tools can bring to Jean Rouch's 'Shared Anthropology' approach.
Supervisors: Professor Chris Speed (Design Informatics) and Dr Jen Ross

CLARA O'SHEA
Kinds of learning and kinds of play: an exploration of identity development in formal and informal digital environments.
Supervisors: Professor Siân Bayne and Dr Hamish Macleod

DIEGO RATES
Student Experience Analytics
Supervisors: Professor Dragan Gašević (Monash University), Professor Siân Bayne and Dr Jeremy Knox

SABINA SAVADOVA

Exploring parental agency and preschool-aged children's interactions with technology at home: A comparative study of Georgia and Azerbaijan.

Supervisors: Professor Lydia Plowman and Dr Holly Linklater

ALEXIA REVUELTAS ROUX

What does engagement look like in early science learning? Funded through Wellcome Trust and Mexico's National Council of Science and Technology (CONACYT).

Supervisors: Dr Andrew Manches, Professor Judy Robertson and Dr Josie Booth

CLARE THOMSON

Tensions in reflective practice – exploring the everyday reflective work of undergraduate medical students.

Supervisors: Dr Jen Ross and Dr Tim Fawns

DEBBIE SCHACHTER

Understanding the awareness and development of critical information literacy frameworks for higher education library instruction.

Supervisors: Dr Pauline Sangster and Dr Jen Ross

SARAH TRELOAR

How online social network sites are being used for informal language learning.

Supervisors: Dr Jen Ross and Dr Maria Dasli



FEATURED: JAMES LAMB

Space, Sociomateriality, Sound. Exploring the Learning Spaces of Higher Education.

My research asks how higher education learning spaces are being affected by the pedagogic and societal shift to the digital. It is concerned with the classrooms, corridors and cafés where learning takes place, and how these places and practices are contingent on computers, code and other digital technologies. In the setting of undergraduate courses in American History and Architectural Design I documented learning spaces and practices through field recordings, photographs and conversation with staff and students. My thesis exposes the complex relationship between learning space and digital technology, while also making the case for the critical value of the audible.

Supervisors: Professor Siân Bayne and Dr Jen Ross

GRADUATES 2017–2018



FEATURED: ASSEM BERNIYAZOVA (2018)

Worldwide diffusion of XXI century educational innovations: Opportunities and challenges for educational institutions in Kazakhstan.

It is important that involved educators carry mutual understandings of what constitutes innovation in education, what future schools should be like, or even, what education generally is for. This thesis comparatively analysed the nation-specific 'social imaginaries' (broad taken-for-granted aspects of the worldview) that shape those understandings in Kazakhstan and Scotland. The Centre for Research in Digital Education, with its critical reflection on current trends and active involvement in various innovative initiatives, served as an inspiring, enriching and supportive environment for this PhD research.

Bolashak International Scholarship

Supervisors: Dr Christine Sinclair and Dr Hamish Macleod

PETER EVANS PHD (2017).

The impacts of social media applications on the theory and practices of work based learning for professionals/ knowledge based occupations

STUART GRAY PHD (2017)

Investigating the effectiveness of an active smart-phone game as a tool for improving executive function in children

SRECKO JOKSIMOVIC PHD (2017)

Networked Learning Analytics

EDER PAULA passed his viva in 2018 and will graduate in 2019 along with PAUL UDOFIA.

SEMINAR PROGRAMME

We have arranged 16 seminars since May 2018 with over 400 enrolments on our seminar programme.

2018	2019
<div><div>JUL 27</div><div><i>The science behind science learning</i> Dr Zayba Ghazali-Mohammed</div></div>	<div><div>JAN 25</div><div><i>What (and why) can we learn by drawing?</i> Professor Shaaron Ainsworth, UK</div></div>
<div><div>MAY 04</div><div><i>Digital Education in Development Contexts in Higher Education: Hybrid spaces, Leapfrogging and Scale</i> Dr Michael Gallagher</div></div>	<div><div>AUG 24</div><div><i>What are algorithms, and how does machine learning work?</i> Dr Greg Michaelson, Professor of Computer Science, UK</div></div>
<div><div>MAY 11</div><div><i>Communities, “Big Data”, and Social Justice</i> Dr Lina Dencik, UK Dr Callum McGregor Dr Gary Fraser</div></div>	<div><div>AUG 12</div><div><i>Policy networks, performance metrics, and market-making: charting the expanding data infrastructure of higher education</i> Dr Ben Williamson</div></div>
<div><div>MAY 24</div><div><i>What kind of learning do we want to promote? A didactical approach.</i> Professor Nicole Durisch Gauthier, CH</div></div>	<div><div>FEB 5</div><div><i>Keeping the Teacher in the Loop: AI technologies for supporting exploratory learning environments</i> Dr Kobi Gal, UK</div></div>
<div><div>MAY 29</div><div><i>The Eye of the Needle: New Understandings of the Complex Barriers to Instructional Innovation with Technology</i> Prof Joel Smith, AU</div></div>	<div><div>FEB 8</div><div><i>AI and Lifelong Learning: fragmentation and individualization</i> Dr Rebecca Eynon, UK</div></div>
<div><div>JUL 4</div><div><i>Addressing Methodological Challenges: A New Approach to Tracing Participation Patterns in Online Writing</i> Dr Alecia Marie Magnifico, US Dr Jen Scott Curwood, AU Associate Professor Jayne C. Lammers, US</div></div>	<div><div>NOV 6</div><div><i>Gadamer, Bakhtin and dialogic space: Implications for teaching and learning in the Digital Age</i> Professor Peter Rule, DE Joint seminar with the Community Education Research Group</div></div>
	<div><div>MAR 29</div><div><i>The Hundred Languages of Children on the Move: Digital technologies & transnational childhoods</i> Dr Sumin Zhao, UK</div></div>
	<div><div>DEC 4</div><div><i>Just Google it: Digital literacy and the epistemology of ignorance</i> Dr Ibrar Bhatt and Dr Alison MacKenzie, IE</div></div>
	<div><div>DEC 7</div><div><i>Digital learning ecologies and postdigital education</i> Dr Petar Jandrić, HR Mitchell Peters (visiting scholar), ES</div></div>
	<div><div>JAN 18</div><div><i>Digital Learning in Schools</i> Kate Farrell, Tom Lawson, Dr Hamish Todd</div></div>

Our complete up-to-date seminar programme can be found at: de.ed.ac.uk/events

Get in touch to sign-up to our newsletter here: DEResearch@ed.ac.uk

FUNDING EXTERNAL

Move2Learn: Embodied learning for pre-school scientists

PI: Dr Andrew Manches
TIMELINE: 1 May 2017–30 Apr 2020
FUNDING: Wellcome Trust
AWARD: £374,411
TOTAL GRANT VALUE: £701,656



Magic Cloud

PI: Dr Andrew Manches
DATE: 13 Jan 2019–14 Jul 2019
FUNDING: ESRC Business Booster
AWARD: £10,000



International Conference of the Learning Sciences Early Career Workshop grant

PI: Dr Zayba Ghazali-Mohammed
DATE: Jun 2018
FUNDING: ICLS
AWARD: £700



Supporting Higher Education to Integrate Learning Analytics (SHEILA)

PI: Professor Dragan Gašević
TIMELINE: 1 Jan 2015–30 Jun 2018
FUNDING: European Commission
AWARD: £136,857
TOTAL GRANT VALUE: £460,612



Co-Creation of an embodied learning technology for early science

PI: Dr Andrew Manches
CO-INVESTIGATOR: Dr Zayba Ghazali-Mohammed
DATE: 1 Jan 2019–31 Dec 2019
FUNDING: Wellcome Trust Translational Partnership Award
AWARD: £19,519



Data Education in Schools

PI: Professor Judy Robertson
DATE: 1 Apr 2019–31 Mar 2027
FUNDING: Integrated Regional Employability and Skills programme (Edinburgh) and South East Scotland City Region Deal
AWARD: £2.4M



GCRF Urban Disaster Risk Hub

PI: Professor John McCloskey (Geosciences)
DIGITAL EDUCATION CO-I: Professor Siân Bayne
DATE: 1 Feb 2019–31 Jan 2024
FUNDING: UKRI Global Challenges Research Fund
AWARD: £40,552
TOTAL GRANT VALUE: £19.6M



FUNDING INTERNAL

Methodological innovations for assessing learning in digital spaces

UOE RESEARCH TEAM: Professor Dragan Gašević, Dr Jen Ross
DATE: 01 Jul 2017–30 Apr 2018
FUNDING: University of Edinburgh and University of Sydney Partnership Collaboration Award
AWARD: £10,950

Ethics and Justice for Data and Artificial Intelligence

PI: Dr Jeremy Knox
DATE: 1 Jan 2019–31 Dec 2019
FUNDING: Global Academy & Edinburgh Futures Institute
AWARD: £5,000

Data Bodies in the library

PI: Dr Philippa Sheail
DATE: 1 Aug 2017–31 Jul 2018
FUNDING: Challenge Investment Fund
AWARD: £11,427

Numbuko

PI: Dr Andrew Manches
DATE: 1 Nov 2018–1 Feb 2019
FUNDING: CAHSS Knowledge Exchange & Impact grant
AWARD: £2,950

Lecture Recording for Inclusive Education

PI: Dr Jeremy Knox
DATE: 1 Jan 2018
FUNDING: Principal's Teaching Award Scheme
AWARD: £14,397

Internet of Things platform for early learning soft toys

PI: Dr Andrew Manches
DATE: 1 Mar 2018–31 Jul 2018
FUNDING: Launch.ed Enterprise Initiative Grant
AWARD: £1,775

Hacking Distance Learning

PI: Dr Jeremy Knox
DATE: 1 Jan 2019
FUNDING: Student Experience Grant
AWARD: £1,908

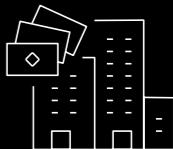
EdAR Augmented and Mixed Reality Education Pilots Project

PI: Dr Andrew Sherlock (School of Engineering)
DATE: 1 Jan 2019–31 Dec 2019
FUNDING: Principal Teaching Award Scheme
AWARD: £14,945



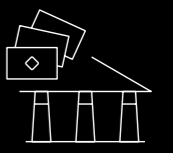
THE UNIVERSITY of EDINBURGH

SUMMARY



EXTERNAL

Digital Education has received new external grants to the value of £2,470,771 during the period April 2018–March 2019, additional to £511,268 external grant funding from continuing projects.



INTERNAL

Digital Education has received new internal grants to the value of £39,200 during the period April 2018–March 2019, additional to £24,152 internal grant funding from continuing projects.

PUBLICATIONS

2019

Bayne, S, Connelly, L, Osborne, N, Tobin, R, Grover, C, Beswick, E & Rouhani, L 2019, **The social value of anonymity on campus.** *Learning, Media and Technology.* Online first. DOI: 10.1080/17439884.2019.1583672

Evans P. **Making an HRD Domain.** *Human Resource Development International.* 22(2), pp. 116-139. DOI: 10.1080/13678868.2018.1564514

Fawns, T & O'Shea, C 2019, **Evaluative judgement of working practices: Reconfiguring assessment to support student adaptability and agency across complex settings.** *Italian Journal of Educational Technology.* Online first. DOI: 10.17471/2499-4324/1027

Lamb, J, Gallagher, M & Knox, J 2019, **On an excursion through EC1: Multimodality, ethnography and urban walking** *Qualitative Research,* 19(1), pp. 55-70. DOI: 10.1177/1468794118773294

Manches, A, McKenna, P, Rajendran, G & Robertson, J 2019, **Identifying embodied metaphors for computing education** *Computers in Human Behavior,* DOI: 10.1016/j.chb.2018.12.037

Robertson, J 2019. **Answering Children’s Questions About Computers.** *Communications of the ACM,* 62(1), pp. 8-9. DOI: 10.1145/3290404

Ross, J 2019, **Casting a line: Digital co-production, hospitality and mobilities in cultural heritage settings** *Curator: the museum journal,* 61(4), pp. 1-18. DOI: 10.1111/cura.12280

Ross, J, Knox, J, Sowton, C & Speed, C 2019, **Mobilising connections with art: Artcasting and the digital articulation of visitor engagement with cultural heritage** *International Journal of Heritage Studies,* 25(4), pp. 395-414. DOI: 10.1080/13527258.2018.1493698

Sinclair, C, and Hayes, S 2019. **Between the post and the com-post: Examining the postdigital ‘work’ of a prefix** *Postdigital Science and Education,* 1(1), pp. 119-131 DOI: 10.1007/s42438-018-0017-4

Tsai, Y-S, Kovanović, V & Gasevic, D 2019, **Learning analytics adoption – approaches and maturity.** In *The 9th International Learning Analytics & Knowledge Conference, 4th March 2019, Tempe, United States.* 9th International Learning Analytics & Knowledge Conference. Available at: https://drive.google.com/file/d/1E4ry7M8 C8Hoyb6MOKM8vybibey-GLiQfP/view

Williamson, B 2019, **Brain Data: Scanning, Scraping and Sculpting the Plastic Learning Brain Through Neurotechnology** *Postdigital Science and Education,* 1(1) pp. 65-86. DOI: 10.1007/s42438-018-0008-5

Williamson, B & Piattoeva, N 2019, **Objectivity as standardization in data scientific education policy, technology and governance** *Learning, Media and Technology,* 44(1), pp.64-76. DOI: 10.1080/17439884.2018.1556215

All publications can be found at: de.ed.ac.uk/publications

2018

Bayne, S 2018, **Posthumanism: A navigation aid for educators** *on_education: Journal for Research and Debate,* 2(1), pp. 1-7. DOI: 10.17899/on_ed.2018.2.1

Bayne, S 2018, **Robotmaestro: Intervenciones en enseñanza automatizada** *Apertura,* 10(2), pp. 140-154.

Chaudron, S, Marsh, J, Donoso Navarette, V, Ribbens, W, Mascheroni, G, Šmahel, D, Černikova, M, Dreier, M, Korkeamäki, R-L, Livingstone, S, Plowman, L, Fletcher-Watson, B, Richardson, J, Shlyapnikov, V & Soldatova, G 2018, **Rules of engagement: Family rules on young children’s access to and use of technologies.** In S Danby, M Fleer, C Davidson & M Hatzigianni (eds), *Digital Childhoods: Technologies in Children’s Everyday Lives. vol. 22, International Perspectives on Early Childhood Education and Development,* Springer Singapore, Singapore, pp. 131-145. DOI: 10.1007/978-981-10-6484-5_9

Dragomir, M, Manches, A, Fletcher-Watson, S & Pain, H 2018, **Facilitating Pretend Play in Autistic Children: Results from an Augmented Reality App Evaluation.** In *Proceedings of the 20th International ACM SIGACCESS Conference on Computers and Accessibility. ACM, 22nd Oct 2018, Galway, Ireland, 20th International ACM SIGACCESS Conference on Computers and Accessibility, Galway, Ireland,* pp. 407-409. DOI: 10.1145/3234695.3241020

Edwards, S, Mantilla, A, Henderson, M, Nolan, A, Skouteris, H & Plowman, L 2018, **Teacher Practices For Building Young Children’s Concepts of the Internet Through Play-Based Learning** *Educational Practice and Theory,* 40(1), pp. 29-50. DOI: 10.7459/ept/40.103

Edwards, S, Nolan, A, Henderson, M, Mantilla, A, Plowman, L & Skouteris, H 2018, **Young children’s everyday concepts of the internet: A platform for cyber-safety education in the early years** *British Journal of Educational Technology,* 49(1), pp. 45-55. DOI: 10.1111/bjet.12529

Fawns, T & O'Shea, C 2018, **Distributed Learning and Isolated Testing: Tensions in Traditional Assessment Practices.** In M Bajić, NB Dohn, M de Laat, P Jandrić & T Ryberg (eds), *Proceedings of the 11th International Conference on Networked Learning 2018, 14th-16th May 2018. Zagreb, Croatia.* 11th International Conference on Networked Learning 2018, pp. 132-139. Available at: http://networkedlearningconference.org.uk/abstracts/papers/fawns_11.pdf

Gallagher, M 2018, **Amira’s complexity and cosmopolitanism: the role of disposition in mobilities and mobile learning.** In M Bajic, T Ryberg, P Jandrić, M de Laat & NB Dohn (eds), *Proceedings of the 11th International Conference on Networked Learning 2018, 14th-16th May 2018. Zagreb, Croatia.* 11th International Conference on Networked Learning 2018, pp. 189-196. Available at: http://networkedlearningconference.org.uk/abstracts/papers/gallagher_18.pdf

Gray, SI, Robertson, J, Manches, A & Rajendran, T 2018, **BrainQuest: The use of motivational design theories to create a cognitive training game supporting hot executive function** *International Journal of Human-Computer Studies.* DOI: 10.1016/j.jhcs.2018.08.004

Howland, K, Good, J, Robertson, J & Manches, A 2018, [Editorial] **Special issue on computational thinking and coding in childhood** *International Journal of Child-Computer Interaction.* DOI: 10.1016/j.jjcci.2018.11.001

Isbel, L & Robertson, J 2018, **Gender balancing staff recruitment: Attracting the right candidates.** In J Robertson, A Williams, D Jones, L Isbel & D Loads (eds), *EqualBITE: Gender Equality in Higher Education.* Sense Publishers, pp. 99-101.

Jandrić, P, Knox, J, Besley, T, Ryberg, T, Suoranta , J & Hayes, S 2018, **Postdigital science and education** *Educational Philosophy and Theory.* DOI: 10.1080/00131857.2018.1454000

Jandric, P, Ryberg, T, Knox, J, Lackovic, N, Hayes, S, Suoranta , J, Smith, M, Steketee, A, Peters, M, McLaren, P, Ford, D, Asher, G, McGregor, C, Stewart, G, Williamson, B & Gibbons, A 2018, **Postdigital dialogue** *Postdigital Science and Education,* pp. 1-27. DOI: 10.1007/s42438-018-0011-x

Knox, J 2018, **Beyond the ‘c’ and the ‘x’: learning with algorithms in the MOOC** *International Review of Education,* 64(2), pp. 161-178 DOI: 10.1007/s11159-018-9707-0

Laurie, M, Manches, A & Fletcher-Watson, S 2018, **A brief report on the use of educational technology with autistic pupils** *The Psychology of Education Review,* 42(2), pp39-43.

Manches, A 2018, **Evaluating technologies for children’s learning: The challenges, and steps to address them.** In L Hamilton & J Ravenscroft (eds), *Building Research Design in Education.* Bloomsbury Academic, pp. 213-236.

Marsh, J, Plowman, L, Yamada-Rice, D, Bishop, J, Lahmar, J & Scott, F 2018, **Play and creativity in young children’s use of apps** *British Journal of Educational Technology,* 49(5), pp. 870-882. DOI: 10.1111/bjet.12622

O'Shea, C 2018, **Learning how kinds matter: A posthuman rethinking lan Hacking’s concepts of kinds, dynamic nominalism and the looping effect.** In M Bajić, NB Dohn, M de Laat, P Jandrić & T Ryberg (eds), *Proceedings of the 11th International Conference on Networked Learning 2018, 14th-16th May 2018. Zagreb, Croatia.* 11th International Conference on Networked Learning 2018, pp. 203-209. Available at: http://networkedlearningconference.org.uk/abstracts/papers/oshea_20.pdf

Perrotta, C & Williamson, B 2018, **The social life of Learning Analytics: Cluster analysis and the ‘performance’ of algorithmic education** *Learning, Media and Technology,* 43(1), pp. 3-16. DOI: 10.1080/17439884.2016.1182927

Robertson, J 2018, **Dealing with imposter syndrome.** In J Robertson, A Williams, D Jones, L Isbel & D Loads (eds), *EqualBITE: Gender equality in higher education.* Sense Publishers, pp. 146-151.

Robertson, J 2018, **Digital education in schools.** In TGK Bryce, WM Humes, D Gillies & A Kennedy (eds), *Scottish Education.* Edinburgh University Press. DOI: 20.500.11820/ec003fc9-8bea-40b7-8b6c-4aa784e817b9

Robertson, J, Macvean, A, Fawknor, S, Baker, G & Jepson, R 2018, **Savouring our mistakes: Learning from the FitQuest project** *International Journal of Child-Computer Interaction,* 16, pp. 55-67. DOI: 10.1016/j.jjcci.2017.12.003

CONTINUES

Ross, J 2018, **Speculative Method as an Approach to Researching Emerging Educational Issues and Technologies.** In L Hamilton & J Ravenscroft (eds), *Building Research Design in Education: Theoretically Informed Advanced Methods.* Bloomsbury.

Sheail, P 2018, **Temporal flexibility in the digital university: Full-time, part-time, flexitime** *Distance Education*, 39(4), pp. 462-479. DOI: 10.1080/01587919.2018.1520039

Tsai, Y-S 2018, **Close-ups: an emotive language in manga** *Journal of Graphic Novels and Comics* 9(5), pp.473-489. DOI: 10.1080/21504857.2018.1480502

Tsai, Y-S, Gasevic, D, Whitelock-Wainwright, A, Muñoz-Merino, PJ, Moreno-Marcos, PM, Rubio Fernández, A, Delgado Kloos, C, Scheffel, M, Jivet, I, Drachsler, H, Tammets, K, Calleja, AR, Kollom, K, Haywood, J, Cantero, N, Gourdin, A, Kelo, M & Benke-Åberg, R 2018, **SHEILA: Supporting Higher Education to Integrate Learning Analytics Research Report.** [Online]. The University of Edinburgh, Edinburgh, UK. [Data Accessed 21st Mar 2019]. Available from: <https://sheilaproject.eu/wp-content/uploads/2018/11/SHEILA-research-report.pdf>

Tsai, Y-S, Moreno-Marcos, PM, Jivet, I, Scheffel, M, Tammets, K, Kollom, K & Gasevic, D 2018, **The SHEILA framework: informing institutional strategies and policy processes of learning analytics** *Journal of Learning Analytics*, 5(3), pp. 5-20. DOI: 10.18608/jla.2018.53.2

Tsai, Y-S, Moreno-Marcos, PM, Tammets, K, Kollom, K & Gasevic, D 2018, **SHEILA policy framework: Informing institutional strategies and policy processes of learning analytics.** In *Proceedings of the 8th International Conference on Learning Analytics and Knowledge (LAK’18), 7-9th Mar 2018, New South Wales, Australia.* ACM Press, Sydney. DOI: 10.1145/3170358.3170367

Tsai, Y-S, Scheffel, M & Gasevic, D 2018, **Developing an evidence-based institutional learning analytics policy.** In *Proceedings of the 8th International Conference on Learning Analytics and Knowledge (LAK’18), 7-9th Mar 2018, New South Wales, Australia.* Society for Learning Analytics Research (SoLAR), pp. 1-4. Available at: <https://drive.google.com/file/d/1wN-swZRDtVjf9W4kY25YjA4uyxlWHD-cy/view>

Tsai, Y-S, Scheffel, M & Gasevic, D 2018, **Enabling Systematic Adoption of Learning Analytics through a Policy Framework.** In *The 13th European Conference on Technology Enhanced Learning (EC-TEL 2018). 3rd Sept 2018, Leeds, United Kingdom.* The 13th European Conference on Technology Enhanced Learning. DOI: 10.1007/978-3-319-98572-5

Williamson, B 2018, **Postgenomic Science, Big Data, and Biosocial Education on_education: Journal for Research and Debate,** 1(2), pp. 1-5. DOI: 10.17899/on_ed.2018.2.7

Williamson, B 2019, **Startup Schools, Fast Policies, and Full-Stack Education Companies: Digitizing Education Reform in Silicon Valley.** In K.J Saltman & A.J Means (eds), *The Wiley Handbook of Global Educational Reform.* Wiley, pp. 283-305. DOI: 10.1002/9781119082316.ch14

Williamson, B 2018, **Silicon startup schools: technocracy, algorithmic imaginaries and venture philanthropy in corporate education reform** *Critical Studies in Education*, 59 (12), pp. 218-236. DOI: 10.1080/17508487.2016.1186710

Williamson, B 2018, **The hidden architecture of higher education: building a big data infrastructure for the ‘smarter university’** *International Journal of Educational Technology in Higher Education*, 15(12). DOI: 10.1186/s41239-018-0094-1

Williamson, B 2018, **Assessment Imaginaries: Methodological Challenges of Future Assessment Machines.** In B Maddox (ed.), *International Large-Scale Assessments in Education: Insider Research Perspectives.* Bloomsbury, pp. 31-52.

Williamson, B 2018, **Digitizing Education Governance: Pearson, Real-time Analytics, Visualisation, and Machine Intelligence.** In A. Wilkins & A. Olmedo (eds) *Education Governance and Social Theory: Interdisciplinary Approaches to Research.* Bloomsbury, pp. 21-42.

Williamson, B 2018, **The Digitized Future of Physical Education: Activity trackers, personal analytics and algorithmic biopedagogie.** In M Thorburn (ed.), *Transformative Learning and Teaching in Physical Education.* Routledge, pp.176-192.

Williamson, B, Bergviken Rensfeldt, A, Player-Koro, C & Selwyn, N 2018, **Education recoded: Policy mobilities in the international ‘learning to code’ agenda** *Journal of Education Policy* DOI: 10.1080/02680939.2018.1476735

Williamson, B, Pykett, J & Nemorin, S 2018, **Biosocial spaces and neurocomputational governance: Brain-based and brain-targeted technologies in education Discourse: Studies in the Cultural Politics of Education,** 39(2), pp. 258-275. DOI: 10.1080/01596306.2018.1394421

Wood, AK, Anderson, P, Macleod, H, Paterson, J & Sinclair, C 2018, **What question? Enabling dialogue between students and their teachers** *Journal of Perspectives in Applied Academic Practice*, 6(2), pp. 108-112. DOI: 10.14297/jpaap.v6i2.324

Wood, AK, Galloway, RK, Sinclair, C & Hardy, J 2018, **Teacher-student discourse in active learning lectures: case studies from undergraduate physics** *Teaching in Higher Education*, 23(7), pp. 818-834. DOI: 10.1080/13562517.2017.1421630

CONTACT
General enquiries:
DEresearch@ed.ac.uk

Director:
Siân Bayne
sian.bayne@ed.ac.uk

Centre for Research
in Digital Education:
**Moray House School
of Education**
St John’s Land,
Holyrood Road
EH8 8AQ Edinburgh

IMPRINT
Editor:
Claire Sowton

Editorial Design:
Peak15
(Sigrid Schmeisser)

Printer:
J Thomson

 **@EDDIGED**
DE.ED.AC.UK

COPYRIGHT
© The University of Edinburgh,
April 2019. We have made
every effort to ensure the
accuracy of the information in
this report before going to print
but please check online for the
most up-to-date information:
www.de.ed.ac.uk.
No part of this publication
may be reproduced without
the written permission of the
University. This report can be
made available in alternative
formats on request. The Univer-
sity of Edinburgh is a charitable
body registered in Scotland,
with registration number
SC005336.

CREDITS
Journal Covers Credits:
Reprinted from International
Journal of Child-Computer
Interaction, Vol 16, Robertson
J, Macvean A, Fawkner S,
Baker G, Jepson R, Savouring
our mistakes: Learning from
the FitQuest project, 55-67,
Copyright (2018), with
permission from Elsevier.

Reprinted from Computers
in Human Behavior, Manches,
A, McKenna, P, Rajendran,
G & Robertson, Identifying
embodied metaphors for
computing education,
Copyright (2019), with per-
mission from Elsevier.

How technology,
culture, learning and
policy intersect within
research and practice
in digital education.

DE.ED.AC.UK



THE UNIVERSITY of EDINBURGH
Moray House School
of Education

