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.
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

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 retirement 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

Dr Rory Ewins
Lecturer
Rory’s research interests include how we learn and teach about digital citizenship, the implications of intellectual property for digital education, and digital education in developing countries.

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.

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.

Pete’s research interests are in social media and professional and workplace learning.

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.

Michael’s research focuses on educational mobilities, how technology structures and manages these mobilities, and the impact of these movements on local knowledge practices and communities.
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.
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DR ANDREW MANCHES Centre Co-Director (Children & Technology) and Co-deputy 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, Ping Ltd.
amanches@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.
vlooda@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’.
claraoshea.wordpress.com
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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

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.
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@jar

DR PHILIPPA SHEAIL Centre Co-Director (Digital Cultures) and Senior 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
@philishe

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.
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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).
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@yi_shan_tsai

BACKGROUND
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

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

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

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 policymakers.
yuchen.wang@ed.ac.uk

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

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
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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

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.
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@tommylawson

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

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 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.

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.

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CONSULTANTS
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
Jun 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
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»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.

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.

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 Melton 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 ALEGIA MAGNIFICO (University of New Hampshire, USA) and Associate PROFESSOR JANEY LAMMERS (University of Rochester, USA) advocated for transliteracies 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 potential of digital spaces to addressing the methodological challenges of tracing participation patterns in online writing.

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.

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.

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

Cara Workshop in Istanbul, September 2018
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.

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: Dr Jen Ross
FUNDER: AHRC
TEAMS: Professor Melissa Terras and Dr Christopher Ganley and Mairi Lafferty
PROJECT DATES: 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.
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

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 2021
Integrated Regional Employability and Skills programme (Edinburgh) and South East Scotland City Region Deal

CONTACT
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CHILDREN & TECHNOLOGY

© Flickr: DejanKrsmanovic (Creative Commons)
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 HAWISH 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.teaches.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 Fawkner 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 A/CH 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.
HK: Judy Robertson gave a keynote for the 13th Workshop in Primary and Secondary Computing Education in October 2018 in Pozdam.
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
PROJECT DATES: 1 Apr 2019 – 31 Mar 2022
TEAM: Kate Farrell and Tommy Lawson
FUNDER: Integrated Regional Employability and Skills programme (Edinburgh) and South East Scotland City Region Deal
AWARDS: £2.4M
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.

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:
Libby Odai

FUNDER:
ESRC Business Booster

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

PROJECT DETAILS

PRINCIPAL INVESTIGATOR:
Dr Andrew Manches

PROJECT DATES:
1 Jan 2019–31 Dec 2019

TEAM:
Dr Zayba
Ghazali-Mohammed

AWARDS:
£19,519

Jamie Menzies
[Research Assistant]

FUNDER:
Wellcome Trust Translational Partnership Award

FEATURED PUBLICATIONS

Manches, A, Alvienna, 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

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: 10.1111/bjet.12622

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

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.
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
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»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 DENCIK, 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 Cambridge, 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 KÖBI 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 (keynotes, 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 Malmö 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?
The SHEILA team included 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.

PROJECT DETAILS

PROJECT NAME: Supporting Higher Education to Integrate Learning Analytics (SHEILA)
PROJECT DESCRIPTION: 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.

PROJECT DATE: 30 Jun 2018
PROJECT DURATION: 1 Jan 2015 – 30 Jun 2018
PROJECT FUNDING: European Commission
PROJECT VALUE: Total grant value: £136,857
PROJECT AWARD: £136,857

RESEARCH ASSOCIATE:
Dr Yi-Shan Tsai

PROJECT INVESTIGATOR:
Professor Dragan Gašević

FUNDING:
European Commission
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.

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.
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

**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 Galévić (Monash University) and Seongsook Choi

**SHARON BOYD**
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

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

**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 Galévić (Monash University), Professor Siân Bayne and Dr Jeremy Knox
SEMESTER PROGRAMME

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

2018

2019

What (and why) can we learn by drawing?
Professor Sharon Ainsworth, UK

Keeping the Teacher in the Loop: AI technologies for supporting exploratory learning environments
Dr Rob Gal, UK

Digital Education in Development Contexts in Higher Education: Hybrid spaces, Leapfrogging and Scale
Dr Michael Gallagher

AI and Lifelong Learning: fragmentation and individualization
Dr Rebecca Eynon, UK

The science behind science learning
Dr Zayba Graziah-Mohammed

The Hundred Languages of Children on the Move: Digital technologies & transnational childhoods
Dr Sumin Zhao, UK

What are algorithms, and how does machine learning work?
Dr Greg Michaelson, Professor of Computer Science, UK

Just Google it: Digital literacy and the epistemology of ignorance
Dr Ilirar Bhatt and Dr Alison Mackenzie, IE

Policy networks, performance metrics, and market-making: charting the expanding data infrastructure of higher education
Dr Ben Williamson

Digital learning ecologies and postdigital education
Dr Peter Jansz, HR

Addressing Methodological Challenges: A New Approach to Tracing Participation Patterns in Online Writing
Dr Alexia Marie Magnifico, US

Digital Learning in Schools
Kate Farrell, Tom Lawson, Dr Hannah Todd

SRECKO JOKSIMOVIC PHD (2017)
Networked Learning Analytics

DEBRA KENNEDY

PETER EVANS PHD (2017)
The impacts of social media applications on the theory and practices of work-based learning for professionals/knowledge-based occupations

Supervisors: Dr Jan Ross and Dr Andrew Manches

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 pedagogical and societal shift to the digital. It is concerned with the classrooms, corridors and cafes 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 Sian Bayne and Dr Jen Ross
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

International Conference of the Learning Sciences Early Career Workshop grant
PI: Dr Zayba Ghazali-Mohammed
DATE: Jun 2018
FUNDING: ICLS Award
AWARD: £700

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: Dr Philippa Shaill
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

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

Methodological innovations for assessing learning in digital spaces
USER RESEARCH TEAM: Professor Dragan Gašević, Dr Jan Ross
DATE: 1 Jul 2017–30 Apr 2018
FUNDING: University of Edinburgh and University of Sydney Partnership Collaboration Award
AWARD: £10,950

Data Bodies in the library
PI: Dr Philippa Shaill
DATE: 1 Aug 2017–31 Jul 2018
FUNDING: Challenge Investment Fund
AWARD: £11,427

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

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

2019

2018
Manches, A, McInerney, P, Rajendran, G & Robertson, J 2019, Identifying embodied metaphors for computing education Computers in Human Behavior. DOI: 10.1016/j.cubeh.2018.05.037
Sinaric, C and Hayes, S 2019, Between the post and the com-post: Examining the postdigital ‘work’ of a pre-service Postgraduate Science and Education, 1(1), pp. 119-131. DOI: 10.17899/ieeetc.12017010670
Williams, B & Pitáhava, N 2019, Objectivity as standardization in data scientific education policy, technology and governance Learning, Media and Technology, 44(3), pp. 64-74. DOI: 10.1080/1745984X.2019.1655625
Gray, S, 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.ijhcs.2018.06.004
Isbel, L & Robertson, J 2018, Gender balancing staff recruitment: Attracting the right candidates In J Robertson, A Williams, D Jones, L Isbel & G D O’Donnell (eds), EquitBITE: Gender Equality in Higher Education Sense Publishers, pp. 99-101. DOI: 10.1007/978-3-319-92170-0
Manches, A 2018, Evaluating technologies for children’s learning: The challenges, and steps to address them In R. Hamilton & J Ravenscroft (eds), Building Research Design in Education Bloomsbury Academy, pp. 213-236.
Robinson, J 2018, Dealing with impostor syndrome In J Robertson, A Williams, D Jones, L Isbel & D O’Donnell (eds), EquitBITE: Gender equality in higher education: Sense Publishers, pp. 146-151
Robinson, J 2018, Digital education in schools In TK Bayne, S Vicari, VM Humes, C Giles & A Kennedy (eds), Scottish Education Edinburgh University Press. DOI: 10.1017/9781786783990.009

CONTINUES


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

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