The Centre for Research in Digital Education is based in the Moray House School of Education and Sport 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 policy-makers, 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.
Summing up the last year of work is impossible without connecting it to the complex and strange times that we have been working through over 2020 into 2021. Jim Carruth’s poem does a brilliant job of capturing some of this, and of looking ahead to different — happier — times. For the Centre it has been a year in which we have all, of course, been profoundly affected by COVID. Some of us have been unwell, some of us have had losses, many have struggled with difficult caring responsibilities and been separated and isolated from our families — and we have all had to push through the everyday strangeness of social and physical distancing and its effects. In such a context it doesn’t seem appropriate to use this editorial to over-emphasise our productivity and outputs — the report itself sets out our rich and diverse achievements over the last year, often in the most difficult of circumstances. It includes a new infographic which shows the reach and nature of our knowledge exchange and connections (p.10–11), and it also looks forward with an overview of our work with the Edinburgh Futures Institute (p.14), and a reflection on our new commissioned web site illustrations (p.15). These — when they go live — we hope will help mark a return to better times.

Jim Carruth, Glasgow’s poet laureate and NHS worker

For the times ahead when we will be as if at either end of the long bench where distance kept is love’s measure and death dances the space between when words alone are not enough and queued memories reach out to touch let longing be a store of nut and seed that grows each day in strange hibernation readying for its end — the sharing of the feast.

Jim Carruth, Glasgow’s poet laureate and NHS worker

Sian Bayne Centre Director and Professor
**ACADEMICS**

- **DR JEREMY KNOX**  
  Lecturer in Digital Education, Centre Co-Director  
  Jeremy is Programme Co-Director of the MSc Digital Education. His research is currently focused on critical approaches to AI, machine learning, algorithms and ‘big data’ in higher education, with a particular interest in China. Jeremy also convenes the Society for Research in Higher Education (SRHE) Digital University network.

- **DR JAMES LAMB**  
  Lecturer in Digital Education  
  James teaches on the MSc Digital Education and with the Edinburgh Futures Institute. His research is interested in multimodality and the relationship between digital technologies and learning spaces.

- **DR ANDREW MANCHES**  
  Senior Lecturer in Learning Sciences, Centre Co-Director  
  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 manages his academic world with industry as CEO of an early learning technology company, Pling Ltd.

- **DR PHILIPPA SHEAIL**  
  Lecturer in Digital Education  
  Phil is a Lecturer in Digital Education and teaches on the MSc 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. In recent years, Phil has been developing research with academic libraries and the wider GLAM (galleries, libraries, archives and museums) sector. She is currently developing ethnographic work on crowdsourcing, digital volunteers, and public education.

- **PAUL NISBET**  
  Senior Research Fellow  
  Paul is a Senior Research Fellow and Director of CALL (Communication, Access, Literacy and Learning) Scotland. Paul has led national research projects such the development and evaluation of Digital Examinations with the Scottish Qualifications Authority for learners with disabilities. Digital Question Papers were first introduced by SQA in 2008, and subsequently by most other UK examination boards in 2014. Paul’s most recent research in this field examines the limitations of digital question papers for learners who use screen reader or braille display technologies. Paul joined the Centre in February 2021.

- **DR KATE MILTNER**  
  Postdoctoral Fellow  
  Kate is a Train@Ed Postdoctoral Fellow and a Co-Director of the Digital Social Science Cluster at the Centre for Data, Culture, and Society. Her research focuses on the intersections between technocultures and structural power; her postdoctoral project is an examination of coding initiatives in the UK.

- **CLARA O’SHEA**  
  Associate Lecturer  
  Clara teaches on the MSc in Digital Education. Her research interests focus on identity development in formal and informal digital environments.

- **DR BEN WILLIAMSON**  
  Chancellor’s Fellow, Centre for Research in Digital Education and the Edinburgh Futures Institute  
  Ben researches educational data infrastructures and intimate data relating to students’ psychological states, neural activity, and genetic profiles. He focuses on the implications for educational policy and practice.

- **DR CLAIRE SOWTON**  
  Communications and Knowledge Exchange Coordinator, Research Support  
  Claire leads on communications and manages the knowledge exchange work of the Centre. She is Co-Investigator on the Move2LearnTeachers project.

- **ANGELA HUNTER**  
  Centre Administrator, Research Support  
  Angie organises all aspects of the day-to-day running of the Centre and provides focused support to Data Education in Schools.

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**RESEARCH ASSISTANT**  
Jami 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.

- **CLARA O’SHEA**  
  Associate Lecturer  
  Clara teaches on the MSc in Digital Education. Her research interests focus on identity development in formal and informal digital environments.

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  Centre Administrator, Research Support  
  Angie organises all aspects of the day-to-day running of the Centre and provides focused support to Data Education in Schools.
**HONORARY SCHOLARS**

**PROFESSOR JEFF HAYWOOD**

**PROFESSOR EMMERITUS**
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.

[jeff.haywood@ed.ac.uk](mailto:jeff.haywood@ed.ac.uk)

**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.

[h.a.macleod@ed.ac.uk](mailto:h.a.macleod@ed.ac.uk)

**PROFESSOR MARTIN LAWN**

**HONORARY PROFESSOR**
Martin was Founding Editor of the European Educational Research Journal and the first Secretary General of the European Educational Research Association. He has researched and published on teacher professionalism, the European education policy space and the rise of data in governing education systems. Recent books include *Assessment Cultures: historical perspectives* and *The Rise of Data in Education Systems: collection, visualisation and use*. In recent years, Martin has been working in two Swedish Research Council projects: 'From Paris to PISA – Governing education by comparison 1867–2015' and 'The Disembedded Laboratory – Torsten Husén and the Internationalisation of Educational Research for Policy'.

[martin.lawn@ed.ac.uk](mailto:martin.lawn@ed.ac.uk)

**PROFESSOR SIR TIM O’SHEA**

**PROFESSOR EMERITUS**
Professor Sir Timothy O’Shea was Principal and Vice-Chancellor of the University of Edinburgh from October 2002 – February 2018. His academic output covers topics relating to computer based learning, artificial intelligence, and mathematics education.

[timothy.o'shea@ed.ac.uk](mailto:timothy.o'shea@ed.ac.uk)

**DR CHRISTINE SINCLAIR**

**HONORARY FELLOW**
Christine was Programme Director on the MSc in Digital Education from 2015 to 2018. She is 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.

[christine.sinclair@ed.ac.uk](mailto:christine.sinclair@ed.ac.uk)

**PROFESSOR DRAGAN GASEVIĆ**

**HONORARY PROFESSOR**
Dragan is Professor of Learning Analytics in the Faculty of Information Technology and Director of the Centre for Learning Analytics at Monash University. Dragan develops computational methods that can shape next-generation learning technologies and advance our understanding of self-regulated and social learning.

[dragan.gasevic@ed.ac.uk](mailto:dragan.gasevic@ed.ac.uk)
SHARING OUR RESEARCH

Bringing together data from our events, publications, funding and partners, this year’s infographic gives an overview of the ways in which we have connected with our four main research user groups.

**PRACTICE**

The COVID ‘digital pivot’ meant that our practice-oriented work was foregrounded over the last year, particularly evidenced in the number of event enrolments from practitioners across all education sectors.

**PUBLIC**

Work with and for the public sector has been strong this year, particularly through our partnership networks in development contexts and with cultural heritage organisations.

**POLICY**

We have continued to grow our work in policy-related areas this year, with the data reflecting our increasing profile in influencing decision-making particularly through public bodies and our work with NGOs.

**INDUSTRY**

Though a proportionally small part of our work this year, we are developing plans to further build our partnerships and work with companies, social enterprises and trades.
We are the home of the MSc Digital Education, and run a popular course on ‘Children and Technology’ as part of the MSc Education. A new MSc in Education Futures is under development (see p.14), and we also of the thriving community of doctoral students shown here.

**DOCTORAL STUDENTS**

**SHARON BOYD**
Place-responsive higher education at a distance
Dr Jen Ross
Professor Lydia Plowman

**ELEANOR CAPALDI**
The Lives of Digitised Artworks
Dr Jen Ross
Professor Melissa Terras (Edinburgh Futures Institute)
Christopher Garley and Maíri Lafferty (National Galleries of Scotland)

**NOREEN DUNNETT**
Re-imagining disengagement from learning: the sociomaterial practices of classrooms and digital game spaces.
Professor Siân Bayne
Dr Hamish MacLeod

**MAUREEN FINN**
Professor Siân Bayne
Dr Jen Ross

**SABINA SA VADOVA**
Living journals: Young children, their digital practices and families in Azerbaijan
Professor Lydia Plowman
Dr Holly Limlatter

**STEFAN SOWA**
Preparing for the Future of Work: Job Automation Risks and Primary School Pupils’ Career Aspirations and Development
Dr Andrew Manches
Dr Julie Smith

**PARTHA DEY**
uberculosis and mobile phones
Dr Ben Williamson

**SHIKHA KUMARI**
Emerging Digital Technologies and their influence in Higher Education: A Semicomateriality Approach
Dr Jeremy Knox
Dr Michael Gallagher

**JOHN MORRISSON**
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.

**ZARINA MUMINOVA**
Parental engagement in young children’s learning in rural Tajikistan
Professor Lydia Plowman
Dr Jack Lee

**DIEGO RATES**
Analytics to help staff and students in the evaluation and enhancement of the student experience in Scottish Universities: a design research
Professor Dragan Galević
Professor Siân Bayne
Dr Jeremy Knox

**ALEXIA REVUELTAS ROUX**
What does engagement look like in early science learning?
Funded through the Wellcome Trust and Mexico’s National Council of Science and Technology (CONACYT).
Dr Andrew Manches
Professor Judy Robertson
Dr Josie Booth
Over the last year colleagues in the Centre have been doing a lot of work to continue to build the new Edinburgh Futures Institute (EFI). The EFI is a large strategic project for the university, which will create a location and focus for new kinds of interdisciplinary teaching and technology-oriented research. The EFI will be based in the historic old Edinburgh Royal Infirmary, located in the central campus area of the university and now under renovation. When this massive building opens in 2023 it will provide 1,300m² of floor space with new teaching and event spaces, meeting rooms and research hubs.

Our research has been critical in driving the development of the education portfolio for EFI, including developing new technology-enabled forms of lifelong learning and interdisciplinary postgraduate education designed around the principles of mobility, accessibility and flexibility for our students. Siân Bayne has been leading this work as EFI’s education director.

We are also building a new Masters programme in Education Futures to run through EFI, with Jen Ross and James Lamb in the lead. Huw Davies, Ben Williamson and Andrew Manches are contributing to teaching the programme alongside many others from across the university. This programme will launch in 2022, focusing on education as a site of future-making. It will look at the teaching and learning that takes place across classrooms and campuses alongside that which happens within communities, museums, companies, start-ups, government and other public and private organisations. Students will make critical links between education and data-driven innovation as they explore the geographies, mobilities, values and ethical issues that come along with educational innovation through data and technology. The programme will sit alongside and complement our current, world-leading online MSc programme in Digital Education.

Ahead of all this we are also working on two EFI-supported research activities, with a new PhD studentship focusing on the ethical and social futures of data-driven education (Joe Noteboom, supervised by Jen Ross with Karen Gregory from the School of Social and Political Science), and an exciting new project in data justice and the rights to the city led by Jeremy Knox (partnering with Callum McGregor and Morgan Currie in Social and Political Science).

High quality design has always been important to the Centre and we understand how essential this is for exciting the people who engage with our research. Our annual reports, designed by Sigrid Schmeisser at Peak15 Design, are one great example of this. Over the last year we have also been working with an illustrator, Astrid Jaekel, to develop new illustrations for our Centre website.

Digital areas of work often have a problem with sourcing good images—stock photos are generally clichéd and tired (laptop keyboards, screens, young people with devices, Matrix-style binary code). While we have tried to work against this by sourcing attribution-free images which are more abstract, these too can start to feel generic. For that reason we decided we would like to commission original illustrations from a local artist to use on our site.

We wanted images that are relevant to the topics we work on, but which represent the idea that technology is socially and environmentally embedded—not a ‘tool’, fetish object or shiny device over which we huddle, but a component of the condition of 21st century humanity, a gathering of the material resources of our planet, a live connection between regions, ideas, people and things.

For that reason we were delighted that Astrid took on the work—her style is community-connected, using a playful mix of media and form which relates perfectly to the multiple disciplines, diverse methodologies and varied forms of our research.

Astrid’s images position digital education within a natural world which is playful but not sweet—they have an edge to them which asks us to question the place of ‘digital’ and ‘technology’ in the world. These images create a hopeful visual expression of our work—one which reflects the post-COVID era and offers a connected, sustainable imaginary for the future of digital education.

Some of the images are used here in the report, and the whole set will be going up on our web site during June—please look out for them and let us know what you think.
»Work in this strand offers crucial insights into how digital cultures shape education in a wide range of contexts—from museums to universities, from workplaces to low-resource community settings.«

DR JEN ROSS

Research in this strand takes a critical perspective on digital cultures, drawing from multiple disciplines.

We are actively researching high impact areas including digital pedagogies and futures, digital cultural heritage, workplace learning and international development and education.

Education, knowledge, labour, creative industries 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.

Foundations for All provides insights on how to effectively facilitate access to and future success in higher education for displaced and refugee young people in resource-poor environments through contextualised blended bridging programs.

This action-based project will research and evaluate the implementation of a blended-learning Foundations for All degree for refugee scholars. The one-year programme will be offered online, equipping refugee scholars who have had their education disrupted or are unable to provide documentation of their academic record, with skills and a qualification that will allow them to begin an undergraduate degree.

The project has been funded by the Mastercard Foundation and is working with the Refugee Law Project, Makerere University, and American University of Beirut. The academic team at the University of Edinburgh brings together researchers based in Moray House School of Education and Sport, the School of Social and Political Science, Durham University and the Open University.

»The Foundations for All project supports the Refugee Law Project in advocating for policy change for refugees and displaced persons.«

A pilot curriculum developed out of two years of research and design is currently running in Kampala, the capital of Uganda, as well as the Kiryandongo Refugee Settlement. Each location is staffed by a team of tutors from the Refugee Law Project and each site has 20 students—a total of 40 refugee students from South Sudan, Somalia, and Democratic Republic of Congo (DRC) primarily.

The pilot is designed to be run again to more refugees and internally displaced persons as needed. Refugee Law Project do a great deal of activism for refugees in terms of policy and this project is intended to make this advocacy more impactful.

Worldwide, there are over 70 million refugees and forcibly displaced people. The refugee population in Uganda at ~1.46 million makes up 3.6% of the country’s total population of 39 million. Most refugees are from South Sudan (74%), 19% are from the DRC, and 3% are from Burundi*. Less than 3% of refugees worldwide enter higher education, a statistic that this project attempts to begin to address.


Principal investigator
Jean-Benoit Falisse (School of Social and Political Science)

Co-Is
Dr. Michael Gallagher - Dr. Kate Symons (Open University) - Dr. Georgia Cole (School of Social and Political Science) - Dr. Michael Crawley (Durham University)
Digital Footprints and Search Pathways

Working with National Collections in Scotland during Covid-19 lockdown to design future online provision.

**Principal Investigator**
Professor Gobinda Chowdhury
University of Strathclyde

**Team**
Dr Jen Ross
Centre for Research in Digital Education
Christopher Ganley
National Galleries of Scotland
Chanté St Clair Inglis
National Museums Scotland

**Funder**
AHRC Towards a National Collection / UKRI Covid-19 Fund

**Award**
£7,146

**Duration**
1 Year

**Dates**
1.2.2021 – 12.2022

**Total grant value**
£160,010

**View**
bit.ly/2QaGe8Y

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The University of Data: Ethical and Social Futures of Data-Driven Education

This studentship, held by Joe Noteboom, is exploring higher education as a site of data-driven innovation and ethical debate.

**Project Lead**
Dr Karen Gregory
School of Social and Political Science
Dr Jen Ross

**Funder**
Edinburgh Futures Institute
(Baillie Gifford Data Ethics studentship)

**Award**
N/A

**Duration**
3 Years

**Dates**
10.2020 – 9.2023

**View**
bit.ly/30pFm37

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Co-designing with Speculative Data Stories: Higher Education After Surveillance

A new, digital approach to working with stakeholders in higher education to understand and shape data futures and surveillance practices in universities.

**Principal Investigator**
Dr Jen Ross

**Team**
Dr Amy Collier
Dr Jane McKie
Dr Anna Wilson

**Funder**
Edinburgh Futures Institute

**Award**
£5,000

**Duration**
5m

**Dates**
15.2.2020 – 31.7.2020

**View**
bit.ly/30pFm37

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Foundations for All

Supporting success in higher education for displaced and refugee young people through online distance learning.

**Principal Investigator**
Dr Jean-Benoit Falisse
School of Social and Political Science

**Funder**
Mastercard Foundation

**Award**
£72,705

**Duration**
2.5 Years

**Dates**
1.7.2019 – 30.12.2021

**Total grant value**
£218,115

**View**
bit.ly/2BU4Yex

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GCRF Urban Disaster Risk Hub

Working across countries to bring disaster risk management to the centre of global urban policy and practice.

**Principal Investigator**
Professor Siân Bayne

**Funder**
UKRI Global Challenges Research Fund

**Award**
£40,552

**Duration**
5 Years

**Dates**
1.2.2019 – 31.12.2024

**Total grant value**
£19.6M

**View**
bit.ly/30skybk

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Digital Education research cluster, Nigeria, Tanzania, Uganda

Interdisciplinary research to understand the New Urban Agenda, adopted at the United Nations Conference on Housing and Sustainable Urban Development in 2016.

**Principal Investigator**
Dr Michael Gallagher

**Funder**
GCRF Theme Development Fund

**Award**
£23,000

**Duration**
18m

**Dates**
11.2019 – 24.6.2020

**View**
bit.ly/2UaAHzc

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Projects 2020-2021

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GCRF Urban Disaster Risk Hub

Working across countries to bring disaster risk management to the centre of global urban policy and practice.

**Principal Investigator**
Professor Siân Bayne

**Funder**
UKRI Global Challenges Research Fund

**Award**
£40,552

**Duration**
5 Years

**Dates**
1.2.2019 – 31.12.2024

**Total grant value**
£19.6M

**View**
bit.ly/30skybk
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

Digital technology increasingly shapes the way young people live and learn. The outcomes of our research provide insights and support for decision-makers, parents and teachers by building our understanding of the place of technology in young children’s lives. It also informs the design of digital technologies for young children and catalyses debate around technology-oriented issues in their lives.

FEATURED PROJECT

Move2Learn4Teachers: Co-Design of early STEM training and resources

About

Move2Learn4Teachers will engage and learn from leading STEM (Science, Technology, Engineering and Mathematics) education providers, teachers, and children in order to co-design meaningful and useful teacher training and materials that draw from, and inform, Move2Learn research.

Move2Learn is a major UK-US Science Learning+ project investigating how interactive museum exhibits and informal learning (i.e. out of school) facilitation can be designed to improve children’s enjoyment, confidence and understanding in STEM from the earliest years (3–6 years).

Who are you working with?

The Centre for Research in Digital Education team, led by PI Dr Andrew Manches, is working with researchers from UCL Knowledge Lab in close partnership with two science centre organisations (Glasgow Science Centre and Science Museum Group), a leading STEM educator training provider (Scottish Schools Educational Research Centre), and Graphic Science, an experienced evaluation and STEM engagement consultancy. Ten teachers (UK) will work with the team to co-design 4 project outputs.

Move2Learn4Teachers brings together researchers, informal science educators, teachers and learners to create meaningful early years STEM training resources.

Impact so far?

Project outputs include a 90-minute teacher development session on embodied learning and gesture that will reach approximately 1000 teachers per year, a downloadable resource pack and short animation anticipated to reach over 1000 teachers in the first year and 40 commercially ready units of a charades based game.

Why is it important?

The longer-term impact of this project will be greater confidence and ability of children from diverse backgrounds in STEM owing to teachers’ increased knowledge and confidence, in particular, the use of gestures to communicate STEM concepts. The project is timely, contributing to current and pressing Scottish, UK and global initiatives to empower children from all backgrounds through improved early STEM education.

Principal investigator: Dr Andrew Manches • Co-I (UOE) Dr Claire Sowton • Alexia Revueltas Roux
Co-I (UCL) Professor Sara Price • Minna Nygren
PROJECTS

EdTech Entrepreneurship at UoE
Developing and testing an (early years) prototype Internet of Things ethical EdTech platform.

**PRINCIPAL INVESTIGATOR**
Dr Andrew Manches

**PARTNER ORGANISATIONS**
Pling Ltd technical development
Cramasie hardware prototyping
Na:gne software development

**FUNDER**
Data-Driven Innovation Small Grant Funding - COVID-19

**AWARD**
£10,000

**DURATION**
6m

**DATES**
1.1.2021 – 30.6.2021

**VIEW**
bit.ly/EdTechUoE

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Move2Learn4Teachers: Co-Design of early STEM training and resources
Working with teachers and informal science learning practitioners to promote improved enjoyment and understanding of STEM in schools.

**PRINCIPAL INVESTIGATOR**
Dr Andrew Manches

**CO-I (UoE)**
Dr Claire Sowton
Alexia Revueltas Roux

**CO-I (UCL)**
Professor Sara Price
Minna Nygren

**PARTNERS**
Dr Sharon Macnab
Glasgow Science Centre
Karen Davies
Science Museum
Euan Mitchell
Scottish Schools Education Research Centre
Ben Johnson
Graphic Science

**FUNDER**
ScotPEN Wellcome Engagement Award

**AWARD**
£68,895

**DURATION**
14m

**DATES**
19.2020 – 30.10.2021

**VIEW**
bit.ly/MA2LeT

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Digital Play
A 62 page booklet supporting professionals and caregivers to feel more confident about developing strategies for integrating digital media into family life.

**PRINCIPAL INVESTIGATOR**
Professor Lydia Plowman

**PARTNER**
Playbase

**FUNDER**
CAHSS Knowledge Exchange and Impact grant

**AWARD**
£3,000

**DURATION**
6m

**DATES**

**VIEW**
bit.ly/DigitalPlay21

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Co-Creation of an embodied learning technology for early science
Developing a digital ‘embodied learning’ exhibit as part of Move2Learn.

**PRINCIPAL INVESTIGATOR**
Dr Andrew Manches

**TEAM**
Dr Zayba Ghazali-Mohammed
Jamie Menzies

**FUNDER**
Wellcome Trust Translational Partnership Award

**AWARD**
£19,519

**DURATION**
3 Years

**DATES**
1.1.2019 – 30.10.2021

**VIEW**
bit.ly/2Ylyj90

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Move2Learn: Embodied learning for pre-school scientists
Advancing understanding of the role of embodied interaction in young children’s learning about science in informal settings.

**PRINCIPAL INVESTIGATOR**
Dr Andrew Manches

**TEAM**
Dr Zayba Ghazali-Mohammed
Dr Claire Sowton
Margaret Laurie
Jamie Menzies

**FUNDER**
Wellcome Trust

**AWARD**
£374,411

**DURATION**
4.5 Years

**DATES**
1.5.2017 – 30.10.2021

**TOTAL GRANT VALUE**
£735,272

**VIEW**
bit.ly/2UwhaZk

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STEAM Charades: COVID 19 edition
A pack of 30 cards for primary school teachers developed to help children share experiences of the coronavirus pandemic in a safe, fun and educational way.

**PRINCIPAL INVESTIGATOR**
Dr Andrew Manches

**CO-I**
Dr Claire Sowton

**FUNDER**
ScotPEN Wellcome Engagement Award

**AWARD**
£4112

**DURATION**
3m

**DATES**
1.7.2020 – 30.9.2020

**VIEW**
bit.ly/COVIDCards

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Ctrl Alt Teach
Promoting computing teacher careers to computer science students in Scottish universities.

**PRINCIPAL INVESTIGATOR**
Professor Judy Robertson

**CO-I**
Craig Steel

**FUNDER**
Skills Development Scotland Scottish Informatics and Computer Science Alliance

**AWARD**
£22,700

**DURATION**
1 Year

**DATES**
1.3.2020 – 28.2.2021

**VIEW**
bit.ly/CtrlAltTeach

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DATA SOCIETY

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

DR JEREMY KNOX

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.

FEATURED PROJECT

Biology, data science, and the making of precision education

ABOUT
Advanced technologies that can process complex biological data have transformed the human sciences, and are now being used to conduct studies and generate new knowledge in the field of education. This project examines data-intensive biology as a science-in-the-making and its positioning as a potentially policy-relevant science with significant practical and political implications in education. The overarching objective of the study is to identify and interrogate the organizations, expertise, laboratory practices, and technological machinery that make precision education possible.

WHO ARE YOU WORKING WITH?
The project brings together researchers from the University of Edinburgh (Centre for Research in Digital Education and Centre of Biomedicine, Self and Society) and University of Birmingham (School of Geography, Earth and Environmental Sciences).

IMPACT SO FAR?
’Biology, data science, and the making of precision education’ will question how and why precision education is being developed in order to understand the methodological and technical processes that underpin its knowledge claims. As a result, the project will identify the practical, political and ethical consequences of these new ways of thinking about biology in education.

WHY IS IT IMPORTANT?
Precision education builds on advanced computer technologies and their application in biological sciences, new scientific knowledge about the biological underpinnings of learning and educational outcomes, and advanced computer techniques (biosensors and brain scanners) to assess the biological aspects of learning. These developments propose that diverse forms of biological data produced with computers may be fused together and analysed to develop insights into learning and educational outcomes. For some precision education promoters, biological data may even be used to predict individual outcomes, and to create ‘personalized learning’ interventions that are tailored and targeted to the individual student’s unique biological profile.

PRINCIPAL INVESTIGATOR
Dr Ben Williamson - CO-I
Dr Martyn Pickersgill - Dr Jessica Pykett

»This project will generate insights into the ways biological and data sciences are becoming new sources of knowledge and authority in technological societies.«
PROJECTS

**Biology, data science, and the making of precision education**
Generating insights into the ways biological and data sciences are becoming new sources of knowledge and authority.

**Co-developing ethical principles for the use of AI in education with Squirrel AI**
Engaging with ethical concerns related to the use of AI in education in the context of China.

**Commercialization and privatization of/in education in the context of COVID-19**
Mapping the changing landscape of educational privatization and commercialization during the Covid-19 pandemic.

**Data Justice and the Right to the City**
Examining the harms and civic possibilities of the datafied society and the uneven distribution of resources and rights in urban contexts.

**Who’s coding: investigating UK coding experiences and outcomes**
How social locations and identities of participants impact their experience and outcomes.

**Hacking the Distance Learning Experience: Student-Led Technology Development**
Creating innovative technologies that connect new distance students with the University of Edinburgh learning community.

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**Biology, data science, and the making of precision education**

**PRINCIPAL INVESTIGATOR**
Dr Ben Williamson

**CO-I**
Dr Martyn Pickersgill
University of Edinburgh

Jessica Pykett
University of Birmingham

**FUNDER**
Leverhulme Trust

**AWARD**
£151,516

**DURATION**
2 Years

**DATES**
19.2021 – 19.2023

**VIEW**
bit.ly/3wZzN9x

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**Co-developing ethical principles for the use of AI in education with Squirrel AI**

**PRINCIPAL INVESTIGATOR**
Dr Jeremy Knox

**CO-I**
Dr Li Yuan
Beijing Normal University

Dr Tore Hoel
Oslo Metropolitan University

**FUNDER**
ESRC Impact Acceleration Award

**AWARD**
£11,950

**DURATION**
1 Year

**DATES**

**VIEW**
bit.ly/3unWHEI

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**Commercialization and privatization of/in education in the context of COVID-19**

**PRINCIPAL INVESTIGATOR**
Dr Ben Williamson

**FUNDER**
Education International

**AWARD**
£3,000

**DURATION**
2m

**DATES**
15.2020 – 31.7.2020

**VIEW**
bit.ly/CommPrivHE

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**Data Justice and the Right to the City**

**PRINCIPAL INVESTIGATOR**
Dr Jeremy Knox

**CO-I**
Dr Callum McGregor

Dr Morgan Currie

**FUNDER**
EFI Projects Fund

**AWARD**
£10,100

**DURATION**
1 Year

**DATES**

**VIEW**
bit.ly/2H64C6w

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**Who’s coding: investigating UK coding experiences and outcomes**

**PRINCIPAL INVESTIGATOR**
Dr Kate Miltner

**CO-I**
Dr Gitat Kadar-Satat

University of Warwick

**FUNDER**
European Research Council
H2020 Marie Skłodowska-Curie Actions and the Edinburgh and South East Scotland City Region Deal Data-Driven Innovation Initiative

**AWARD**
£167,000

**DURATION**
3 Years

**DATES**
13.11.2019 – 12.11.2022

**VIEW**
bit.ly/2AIKgmm

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**Hacking the Distance Learning Experience: Student-Led Technology Development**

**PRINCIPAL INVESTIGATOR**
Dr Jeremy Knox

**TEAM**
Dr Michael Gallagher

Dr James Lamb

**FUNDER**
University of Edinburgh Student Experience Grant

**AWARD**
£1,908

**DURATION**
2 Years

**DATES**

**VIEW**
bit.ly/2MKMQpm
Data Education in Schools is supporting young people across the City Region to develop the confidence, competence and ambition to use data to benefit themselves and their communities.

PROFESSOR JUDY ROBERTSON

Data Education in Schools is part of the DDI Skills Gateway programme, funded by the Edinburgh and South East Scotland City Region Deal. The overall programme aims to offer learners across the region pathways to both qualifications and employment in data-focussed fields. Data Education in Schools is the foundational strand of the gateway, offering opportunities for both learners and educators to develop data literacies and skills across all curricular areas and at all stages of the 3–18 curriculum. The Data Education in Schools research strand focuses on the evidence base that ensures our programme evolves as an understanding of data, ethics and society advances.

Defend the Rhino live lesson

ABOUT

Live lessons are interactive, online workshops that introduce learners to data skills topics in an engaging and collaborative way. Our first live lesson, ‘Defend the Rhino’, was developed around image classification of a safari park to demonstrate supervised machine learning to learners and give them the chance to experience working as a data scientist. Learners (P7–S4) were tasked with analysing millions of images to identify where the rhino poachers might be in order to stop them.

Data Education live lessons are free to participate for all schools and run at intervals throughout the year.

WHO DID YOU WORK WITH?

The Data Education in Schools team worked with Craig Steele (Digital Skills Education), Skills Development Scotland and David Hewitson of A Big Egg web development agency, to develop the Defend the Rhino live lesson.

IMPACT SO FAR?

The Defend the Rhino live lesson has been delivered twice so far. The first session ran during November 2020 and was designed for class teachers to bring their learners to. A second live lesson aimed at parents home-schooling took place in February 2021 and was funded by Skills Development Scotland. Since November 2020, Digital Skills Education have recorded 2265 interactions with the event. Feedback from these events has been very positive with 87% of learners saying they would take part in another data skills live lesson.

As a result of the success of Defend the Rhino, the team are working with Digital Skills Education and Skills Development Scotland to develop a new live lesson for 2021 where learners will engage with data visualisation to code their own ‘Data Selfie’.

OUR DATA EDUCATION IN SCHOOLS LIVE LESSONS BUILD ON THE SUCCESS OF THE DIGITAL SKILLS EDUCATION EXISTING CYBER SKILLS LIVE LESSON MODEL. THERE HAS BEEN WIDE-RANGING PARTICIPATION ACROSS SCOTLAND IN THESE CYBER SKILLS LESSONS AND AN UPTAKE IN SCHOOL-AGED LEARNERS PURSUING CYBER SECURITY QUALIFICATIONS. THE DEFEND THE RHINO LIVE LESSON PROVIDES A SUSTAINABLE OPPORTUNITY FOR LEARNERS WITH NO PRIOR OR TECHNICAL KNOWLEDGE TO DEVELOP THEIR INTEREST, UNDERSTANDING AND CONFIDENCE IN DATA LITERACY.

Why is it important?

PRINCIPAL INVESTIGATOR

Professor Judy Robertson • Team: Jo Spiller • Kate Farrell • Tommy Lawson • Jenni Doonan • Craig Steel (Digital Skills Education) • David Hewitson (A Big Egg)

»The live lesson format—where data education meets theatre—offers learners insight and practical experience of data citizenship.«
### Programme & Projects

#### Data Education in Schools
Supporting young people across the City Region to develop the confidence, competence and ambition to use data to benefit themselves and their communities.

**Principal Investigator**
Professor Judy Robertson

**Team**
- Jo Spiller
- Kate Farrell
- Tommy Lawson
- Jenni Doonan
- Dr Serdar Abaci

**Funder**
Integrated Regional Employability and Skills programme, Edinburgh and South East Scotland City Region Deal

<table>
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<td>£2.4M</td>
<td>8 Years</td>
<td>14.2019 - 31.3.2027</td>
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**View**

#### Professional Learning
Understanding the relevance of data to the lives of learners and teachers.

**Aim**
Developing curricula related content and opportunities to develop data skills for primary, secondary and student teachers while building community around qualification delivery and general engagement with digital and data literacy.

**View**

#### Curriculum Development
A world-first data science qualification for school-aged learners, developed in Scotland.

**Aim**
Developing the National Progression Award in Data Science (Levels 4,5,6) with core modules in data citizenship and data science along with optional units including machine learning, data security and computer programming.

**View**

#### Partnership Engagement
By working with a range of industry, community agency and academic stakeholders we aim to combine a diverse range of expertise: data education and pedagogy; real world application of data skills; accessibility; inclusion and outreach.

**View**
- [bit.ly/1JKwOpd](http://bit.ly/1JKwOpd)

#### NPA/PDA Resource Development
Developing resources to support the delivery of two SQA qualifications: the National Progression Award (NPA) in Data Science and the Professional Development Award (PDA) in Data Science.

**Principal Investigator**
Jo Spiller

**Team**
- Kate Farrell
- Effini

**Funder**
Skills Development Scotland

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<tr>
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<th>Duration</th>
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**View**

#### Consulting Young People and Teachers about Computing Education in Scotland
Including the voices of teachers and learners in policy making for computing related qualifications at school.

**Principal Investigator**
Professor Judy Robertson

**Team**
- Dr Fiona McNeill
- Scottish Computing Education Committee
- Kate Farrell

**Funder**
ESRC Impact Acceleration Grant

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<tr>
<th>Award</th>
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<td>1 Year</td>
<td>1.1.2021 - 31.12.2021</td>
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**View**

#### Designing Conversational Assistants to Reduce Gender Bias
Exploring gender bias in conversational assistants to reduce the risk of reinforcing gender stereotypes.

**Principal Investigator**
Professor Judy Robertson

**Funder**
EPSRC

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<th>Award</th>
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<tr>
<td>£188,353</td>
<td>3 Years</td>
<td>1.6.2020 - 31.5.2023</td>
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**View**
- [bit.ly/3hH60NC](http://bit.ly/3hH60NC)

#### British Sign Language Glossary Project: Computing Science
Creating inclusive routes for digital, data and computing education by creating a suitable British Sign Language (BSL) vocabulary for Computing Science, Data Science and Cyber security terms.

**Principal Investigator**
Dr Audrey Cameron

**Team**
- Kate Farrell

**Funder**
Skills Development Scotland

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<th>Award</th>
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**View**

#### Mapping NCCE Resources and Scoping Online NPA Opportunities
Mapping National Centre for Computing Education (NCCE) materials to match the expectations and outcomes in the Scottish Technologies curriculum computing strand and investigating opportunities for post-pandemic blended learning in computing related subjects.

**Principal Investigator**
Tommy Lawson

**Team**
- Scottish Computing Educators Committee
- Education Scotland
- Computing Science Scotland
- British Computer Society
- Schools
- FE and HE
- Students and staff

**Funder**
Skills Development Scotland

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**View**
- [bit.ly/CyberSecStudy](http://bit.ly/CyberSecStudy)

#### Mapping National Centre for Computing Education (NCCE) Materials
To match the expectations and outcomes in the Scottish Technologies curriculum computing strand.

**Funder**
The Data Lab

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**View**

#### Developing Resources to Support the Delivery of Two SQA Qualifications: the National Progression Award (NPA) in Data Science and the Professional Development Award (PDA) in Data Science.

**Funder**
The Data Lab

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**Team**
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- Scottish Computing Education Committee
- Kate Farrell

**Funder**
ESRC Impact Acceleration Grant

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**Principal Investigator**
Professor Judy Robertson

**Funder**
EPSRC

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- [bit.ly/3hH60NC](http://bit.ly/3hH60NC)

This article considers how technologies actually shape the topologies of UK higher education. Using the example of lecture capture systems, we examine the relationship between learning technologies and formations of space and time.


ABACI, S & QUICK, JD 2020, University-wide e-text adoption and students’ use of, preferences for, and learning with e-textbooks. in T Hurley (ed.), *Inclusive Access and Open Educational Resources E-text Programs in Higher Education*. Springer, pp. 113-123. DOI:10.1007/978-3-030-45730-3_10


ABACI, S & QUICK, JD 2020, Indiana University’s faculty-driven inclusive access e-text program. in T Hurley (ed.), *Inclusive Access and Open Educational Resources E-text Programs in Higher Education*. Springer, pp. 37-49. DOI:10.1007/978-3-030-45730-3_4


GALLAGHER, M 2020, Distilling complexity through metastability and mobility: The networked learning of Amara. in N Bondenup Dohrn, P Jandric, T Ryberg & M de Laat (eds), Mobility, Data and Learner Agency in Networked Learning. Springer, pp. 35-47. DOI:10.1007/978-3-030-36911-8_3


Williamson, B 2021, Education technology seizes a pandemic opening, *Current History*, vol. 120, no. 822, pp. 15-20. DOI:10.1525/curh.2021.120.822.15

Beyond its immediate effects during the pandemic in 2020, the expanded use of algorithm-driven learning management systems backed by major corporations has major implications for the future of global education.
Robertson, J & Tisdall, EKM 2020, The importance of consulting children and young people about data literacy, *Journal of Media Literacy Education*, vol. 12, no. 3, pp. 58-74. DOI:10.23860/JMLE-2020-12-3-6

This paper explores the meanings of data citizenship, in light of the findings of a consultation with 96 children and young people (aged between 10–16 years old, from 11 schools) and the wider conceptual debates on citizenship and children and young people’s rights to privacy, participation and education.


The development of Digital Play builds on many years of research on the use of digital media by young children and their families. It focuses on young children aged up to five or six and is intended to be useful for educators, students, childminders and others working with parents and caregivers at home or in early childhood education and care settings.


Ross, J, Curwood, JS & Bell, A, 2020, A multimodal assessment framework for higher education, *E-Learning and Digital Media*. DOI: 10.1077/204275302097201


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