Institution: University of Edinburgh

Unit of Assessment: Education (23)

Title of case study: Pioneering the future of digital education in universities

Period when the underpinning research was undertaken: 2000 – 2020

Details of staff conducting the underpinning research from the submitting unit:

Name(s):	Role(s) (e.g. job title):	Period(s) employed by submitting HEI:
Prof Jeff Haywood	Professor of Education and Technology	2005 – 17; 2017 – present as Professor Emeritus
Prof Sian Bayne	Professor of Digital Education	2006 – present
Dr Jen Ross	Senior Lecturer in Digital Education	2012 – present
Dr Jeremy Knox	Lecturer in Digital Education	2014 – present
Prof Dragan Gasevic	Professor of Learning Analytics and Informatics	2015 – 2018
Dr Philippa Sheail	Lecturer in Digital Education	2016 – present
Dr Ben Williamson	Chancellor's Fellow	2018 – present
Dr James Lamb	Lecturer in Digital Education	2019 – present

Period when the claimed impact occurred: 1 August 2013 – 31 December 2020

Is this case study continued from a case study submitted in 2014? No

1. Summary of the impact

For 20 years, the University of Edinburgh's Centre for Research in Digital Education has researched and pioneered the future of university teaching. It has linked its critical, interdisciplinary research to highly innovative practice with global impact:

1. **it spearheaded massive open online courses (MOOCs)**, broadening the curriculum of the types of courses offered and enhancing MOOC pedagogy through its platform partnerships
2. **it was a role model for digital innovation in teaching**, developing knowledge of effective, critical digital education that influenced universities and organisations globally
3. **it positively influenced and informed educational data policies** at European universities, and through work led by the UK Government and teacher unions in the UK and internationally.

2. Underpinning research

The University of Edinburgh's Centre for Research in Digital Education has developed a body of research that has significantly influenced digital education implementation and practice in universities globally. Its research has focused on three main areas: institutional policy and strategy for digital education; institutional learning analytics policy and higher education data infrastructures; and advanced digital teaching methods for global student cohorts.

Higher education policy and strategy for digital education

Between 2000 and 2012, Haywood's research focused on governance and quality frameworks for digital education across European higher education (HE). His work found that universities which developed digital education strategies, and properly understood student perspectives on digital learning and teaching, were far more effective in supporting academics to implement innovative approaches to digital education. His work with colleagues on changing pedagogical perspectives (2014-15) – in eight countries representative of funding and quality assurance in European higher education – shaped the extent to which universities could address the turn to new pedagogies, open education and use of learning analytics (3.1).

As open education expanded through the emergence of Massive Open Online Courses (MOOCs) in the early 2010s, many universities became able to engage very large numbers of diverse online learners. In this context, Bayne and Ross mapped the UK MOOC landscape and developed robust strategic frameworks for designing high quality open teaching (3.2). Subsequently, Knox's research critically interrogated "open education" itself as an ethos and strategic practice, examining many of the problematic social, economic and political implications for universities engaging with open education, including the new platform partnerships and business models associated with it (3.3).

Student data policies and infrastructures

Gasevic partnered with researchers from six European institutions as part of the Supporting Higher Education to Integrate Learning Analytics (SHEILA) project. The research examined the adoption of learning analytics at 51 higher education institutions across 16 European countries, finding mixed levels of adoption. The research built on Haywood's findings, showing that a lack of formal institutional policy had inhibited some universities' learning analytics use. The SHEILA project also developed an ethical policy framework to help universities implement learning analytics to increase student agency. The framework placed students at the heart of universities' use of analytics, pushing against the "datafication" tendency which sees students primarily as data sources (3.4). Following from this, Williamson's research analysed the politicisation and commercialisation of expanding student data infrastructures and digital platforms in UK higher education, arguing for UK universities to develop policy frameworks that ensure the ethical, pedagogically-valuable use of student data (3.5).

Advanced digital pedagogy

Sheail, Knox, Lamb, Ross and Bayne's book (*The Manifesto for Teaching Online*) published in 2020 is a distillation of a research programme beginning in 2011 which focuses on the politics and practices of digital education (3.6). The research counters the idea that online education is necessarily inferior to in-person teaching, challenges surveillant infrastructures in higher education teaching and interrogates how digital practices change the way universities assess their students. The work of the authors is recognised globally for its emphasis on the value of sociomaterialist perspectives, highlighting the interconnected nature of the human and the technological. This work argues strongly against the dominant view of technology as a tool and education itself as an instrument.

3. References to the research

3.1 Haywood, J., Connelly, L., Henderikx, P., Weller, M. and Williams, K. (2015) *The changing pedagogical landscape: New ways of teaching and learning and their implications for higher education policy.* Report to the Directorate-General for Education and Culture, European Commission, European Union. https://publications.europa.eu/en/publication-detail/-/publication/f43a8447-7948-11e5-86db-01aa75ed71a1

3.2 Bayne, S. and Ross, J. (2014) *The pedagogy of the Massive Open Online Course: the UK view*. Higher Education Academy/AdvanceHE. https://www.heacademy.ac.uk/knowledge-hub/pedagogy-massive-open-online-course-mooc-uk-view

3.3 Knox, J. (2016) *Posthumanism and the Massive Open Online Course: Contaminating the Subject of Global Education*. Abingdon: Routledge (Can be supplied by HEI on request). https://doi.org/10.4324/9781315674032

3.4 Tsai, Y.-S., Scheffel, M. & Gašević, D. (2018) *SHEILA policy framework – supporting higher education to integrate learning analytics*. Research report. https://sheilaproject.eu/wp-content/uploads/2018/11/SHEILA-research-report.pdf

3.5 Williamson, B. (2019) Policy networks, performance metrics and platform markets: Charting the expanding data infrastructure of higher education. *British Journal of Educational Technology*, 50(6), 2794–2809. https://doi.org/10.1111/bjet.12849

3.6 Bayne, S., Evans, P., Ewins, R., Knox, J., Lamb, J., Macleod, H., O'Shea, C., Ross, J., Sheail, P., Sinclair, C. (2020) *The Manifesto for Teaching Online*. Cambridge MA: MIT Press (Submitted in REF2).

4. Details of the impact

During the past 20 years, the Centre for Research in Digital Education has conducted research which has helped shape the future of university teaching – in the UK and worldwide – in the three ways described below.

1. Broadened curricula and enhanced pedagogy in Massive Open Online Courses (MOOCs)

Our work helped expand MOOC curricula globally into the arts, humanities and social sciences, while innovative and high quality digital pedagogies developed through our research were influential in the trajectory of the MOOC movement. The largest and most pioneering platform – Coursera – has been our most notable corporate beneficiary. We have modelled MOOC pedagogy in the 53 MOOCs the University of Edinburgh has offered since 2013, reaching more than 3,000,000 learners who directly benefited from this work through participation in our courses.

As a pathway to this impact, Haywood put his findings on the vital importance of robust institutional policy in digital education (3.1) into practice at Edinburgh from 2012 onwards. This led the Stanford-based MOOC platform, Coursera, to invite the University to become its first UK member [5.1]. Coursera initially offered MOOCs primarily focused on computing science-related topics, but it worked with the Edinburgh team to launch its first humanities and social science MOOCs, subsequently inviting the University of Edinburgh Vice-Chancellor at the time – Professor Tim O'Shea – to join Coursera's board in November 2013 to help build capacity in these disciplines.

One of the Coursera Co-Founders stated that the University of Edinburgh provided significant contributions by broadening the subjects covered in MOOCs by *"demonstrating that there was a significant learner demand for content in the humanities, sciences, and philosophy"* [5.1]. Furthermore, research and expertise from within the Centre informed the development of new and more engaging pedagogic models for MOOCs, influencing *"a range of very different approaches to the presentation, assessment and the use of online educational resources... [that] subsequently served as models to other institutions wanting to experiment with novel pedagogy in an online setting"*. As such, the University of Edinburgh's partnership has been fundamental to the development of the Coursera platform and "*had a significant beneficial effect on the trajectory of the MOOC movement and to our [Coursera's] ability to bring valuable education to tens of millions of learners worldwide*" [5.1].

2. Advanced digital innovation in higher education and critical online teaching practice

Our research has directly benefitted the World Bank Group with positive benefits for many thousands of learners enrolled on their Open Learning Campus. Research by Bayne, Ross and Knox (3.2, 3.3) underpinned the design of the World Bank's first MOOC in 2014. Since then, *"Turn down the heat: why a 4 degree warmer world must be avoided"* has reached 39,000 learners in more than 180 countries. The Centre then helped the organisation replicate this pioneering course design throughout its 14 MOOCs. The Head of the World Bank Group's Open Learning Campus said: *"The expertise of the Edinburgh team has directly contributed to building our capacity for large-scale, open online learning provision… Data on MOOC participants from the initial six MOOCs showed over 110,000 registered participants from over 180 countries… suggesting a course reach previously unseen particularly in open education directed at civil society actors [from non-profit organisations and government agencies]"* [5.2].

The Centre's *Manifesto for Teaching Online* (3.6) has benefitted teachers and leaders in higher education internationally, setting out core principles and critical, research-based perspectives on high quality online teaching which has been highly influential on practice and policy. More than 100,000 professionals participated in the MOOC based on the manifesto (*"E-learning and digital cultures",* 2013). The manifesto has been translated into Spanish, Chinese and Croatian and used in programme curricula across the globe [5.3].

The Executive Director of the Digital Pedagogy Lab and Hybrid Pedagogy stated: *"The research programme synthesised within the* Manifesto for Teaching Online *has had major impact on the work of those of us who practice and interrogate teaching in the context of higher education and digital technologies. [Their work (3.6)] offers practical takeaways but never shies away from asking hard questions about the work of online teaching. This research genuinely pushes the conversation forward in ways that will change the landscape of online education for the better"* [5.4]. Furthermore, a professor at Monash University (Australia) has described how the Centre's research is *"widely recognised as world-leading"*, noting in particular how the Manifesto (3.6) *"has brought together a cross-disciplinary research programme spanning over a decade into a set of principles which I am already seeing used by an international community of higher education practitioners and leaders. This document and set of principles has formed the basis of online pedagogic policy development in our own Faculty, as well as institutions that I work with in Norway and New Zealand"* [5.5].

This body of work has been influential in building practitioners' capacity to help address the challenge of the COVID-19 digital "pivot", influencing their digital competency and pedagogy via our research, engagement and teaching [5.5, 5.6]. The research-led Digital Education Masters programme built on this work (3.6) has to date educated 700 students from 57 nations in advanced online teaching practice and leadership. Alumni from this programme have transformed their universities' policy and practice in digital education. For example, the Deputy Provost, Academic Operations at Athabasca University in Canada stated: *"I have no doubt that were it not for the research of the Centre for Research in Digital Education I would simply not be capable of leading work that is transforming the Canadian Post-Secondary landscape. ...Research into online assessment and issues of student surveillance from various scholars in the Centre (Dr Williamson, Dr Ross, Dr Macleod, Dr Gallagher, and the whole team on the Manifesto for Online Learning) gave me the breadth of understanding needed to respond to the pressures of the COVID crisis"* [5.6].

3. Influenced educational data policies and infrastructures

Gasevic and Tsai's research (3.4) has led universities to introduce new policies on the measurement, collection, analysis and reporting of learners' data across Europe, with significant benefits for institutions and their students. Their work on the SHEILA project developed a new learning analytics policy framework that has been tested and validated by 200 external stakeholders, including university leaders, policy makers, researchers, teaching staff, support professionals and students. The SHEILA framework has changed approaches to learning

analytics at Universidad Carlos III de Madrid, the Open University of the Netherlands, and Tallinn University [5.7].

Ben Williamson's research on data use policies and ethics (3.5) underpinned his contribution to the inquiry of the UK Government All-Party Parliamentary Group on Data Analytics into technology ethics. The Parliamentary Group's final report cited Williamson regarding the importance of clearly stated data analytics principles and purposes – his contribution informed the Parliamentary Group's recommendations that the UK Government lead on work to improve data governance based on public consent, cooperation and openness [5.8]. At a time when digitisation, automation and datafication are informing policy at many institutions, accelerated by the post-COVID-19 digital "pivot", Williamson's work has been used by teacher and lecturer unions: Education International, the global teacher union federation, is using the research to inform how teacher unions globally respond to commercialisation pressures [5.9], with direct benefits for institutions and teachers. A further project and report by Williamson on automation in higher education for the University and Colleges Union forms the basis for its strategic recommendations to the Scottish Government, university managers and trade unions to address the effect of learning technologies and automation on academic and professional services roles [5.10].

5. Sources to corroborate the impact

5.1 Testimonial from Co-founder, Coursera

5.2 Testimonial from Head of Open Learning Campus, the World Bank Group

5.3 'Manifesto for Teaching Online – Manifesto on the Move', available at: https://blogs.ed.ac.uk/manifestoteachingonline/manifesto-on-the-move/

5.4 Testimonial from Co-founder & Executive Director, Digital Pedagogy Lab and Hybrid Pedagogy

5.5 Testimonial from Professor, Monash University

5.6 Testimonial from Deputy Provost, Academic Operations, Athabasca University

5.7 Report on the SHEILA project (see p. 4 of the report for the executive summary and p. 30 for details of adoption of the work), available at: https://sheilaproject.eu/wp-content/uploads/2018/11/SHEILA-research-report.pdf

5.8 Policy Connect report: *Trust, Transparency, and Tech Report: Building Ethical Data Policies for the Public Good* (see pp. 31-34 of the report for Williamson's contributions), available at: https://www.policyconnect.org.uk/appgda/sites/site_appgda/files/report/454/fieldreportdownload/trusttransparentcyandtechreport.pdf

5.9 Report on Williamson's work with Education International: Commercialisation and Privatisation in/of Education in the Context of Covid-19, available at: https://issuu.com/educationinternational/docs/2020_eiresearch_gr_commercialisation_privatisation?fr=sZDJkYjE1ODA2MTQ

5.10 Report on Williamson's project for the UCU, The Automatic University: A review of datafication and automation in higher education, available at: https://www.ucu.org.uk/media/10947/The-automatic-university/pdf/ucus_the-automatic-university_jun20.pdf